



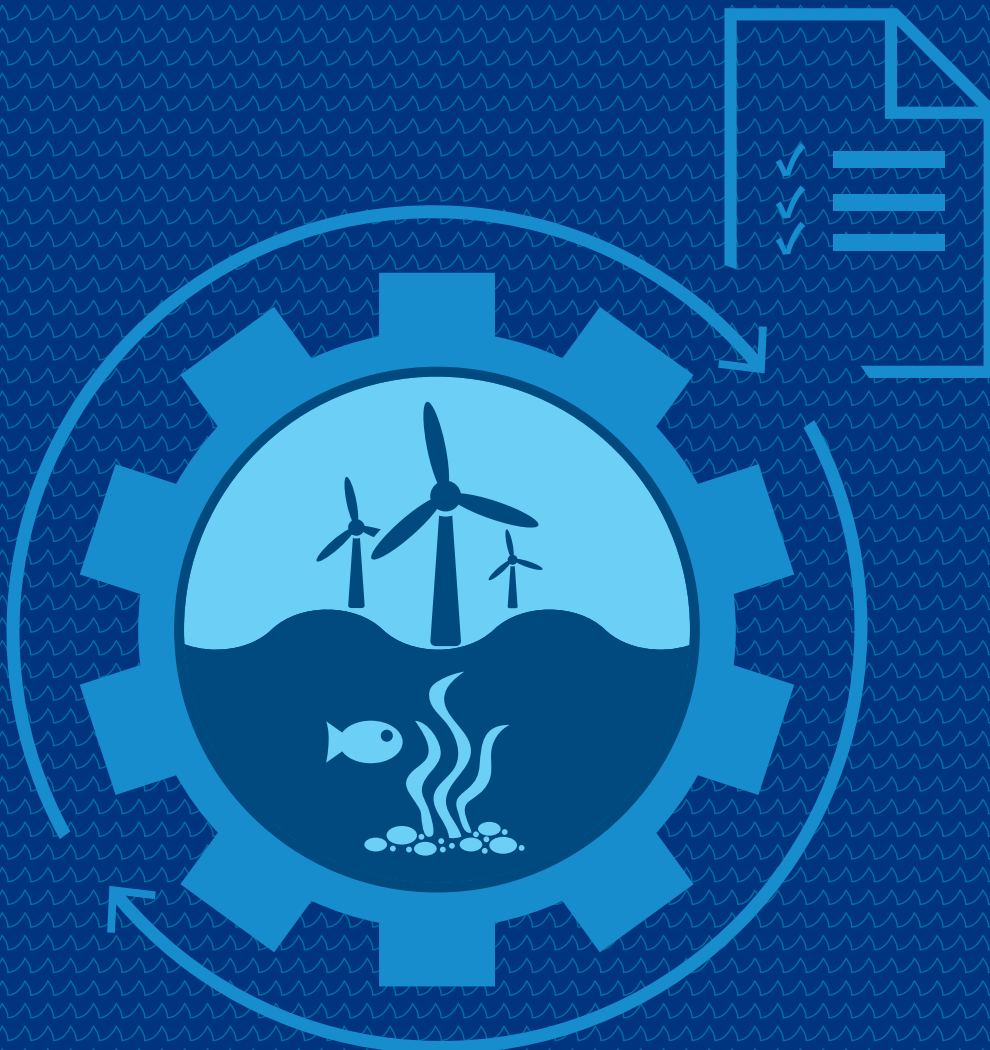
# Guideline for the implementation of ecosystem-based approach in maritime spatial planning (MSP) in the Baltic Sea area



Ecosystem-based management



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This revised Guideline was approved by the HELCOM Heads of Delegation on 16 January 2026 and by the VASAB CSPD/BSC on 2 March 2026.



## 1. Introduction

This document presents a revised version of the Guideline for the implementation of ecosystem-based approach (EBA) in maritime spatial planning (MSP) in the Baltic Sea, which was first adopted in 2016. MSP has developed and countries have built experiences of applying EBA in MSP. The revision aimed to advance a concrete Baltic Sea MSP framework enhancing EBA at all stages of spatial planning processes, based on the experience gained since then. The revised document also reflects recent policy development of the EU, Baltic Sea, and the global landscape and operationalizes the guidelines considering good MSP practices in MSP compiled from the North and Baltic seas.

HELCOM-VASAB Maritime Spatial Planning Working Group initiated the revision of the Guideline in 2023 and established a dedicated task force for the purpose, reporting to the HELCOM-VASAB MSP WG. The Guideline has been developed by the Task Force based on shared experiences and new knowledge gathered in numerous projects. A community of practice on EBA in MSP, consisting of experts representing all European sea basins was established in the DG Mare funded eMSP NBSR project. It enabled an extensive discussion of the concepts and practical recommendations which later laid basis for this revised guideline.

MSP applying an ecosystem-based approach is essential for sustainable use and preservation of ecosystem functioning, aiming to reach good environmental status (GES). It calls for integration of planning and management across sectors and borders, as well as vertical integration of different governance levels. Ecosystem-based MSP is a key step in this greater management challenge, and this EBA guideline is a step towards harmonization of ecosystem-based approach implementation in Baltic MSP.

This document will guide you through the MSP process and provide insights into how to implement an ecosystem-based approach.



## 2. Specifics of spatial planning at sea

MSP is a relatively new process compared to land-use planning. The first plans in Europe were developed in the beginning of 2000s. Now summarizing almost two-decade experience of maritime spatial planning we can highlight the specificity of preconditions for this process which significantly differ from land-use planning.

MSP covers both territorial waters and exclusive economic zones and, in some cases, even internal waters. Territorial waters with full national sovereignty are often owned and/or managed by the state, while land areas are primarily privately owned. Coastal states have the right to exploit resources or arrange other activities within their exclusive economic zones (EEZ), but they are also legally obliged to protect it (Article 2 & 55, United Nations Convention on the Law of the Sea). In addition, the sea is regulated by international agreements, and the freedom of the seas has strong tradition. MSP is an integral part of the ocean governance system. It integrates various national and international policies and legal frameworks in a coordinated way. Thus, it also serves as a tool to embrace interests of multiple stakeholders and resolve potential clashes between sea users' interests.

The marine environment is dynamic by its nature and does not recognize administrative borders, which requires consideration of planning solutions and their potential impact in cross-border or even sea-basin context. It functions in three dimensions (including airspace and subsoil) which complicates obtaining knowledge about the ecosystem functioning. But it also creates opportunities for multifunctional uses of marine areas. Further, the sea has no human inhabitants; rather, it is of economic interest for multiple maritime industries which either use sea areas for transportation, energy and food production or exploit marine resources. As a result, though terrestrial and maritime planning are parts of the overall spatial planning system, the latter is publicly not that well recognized as the terrestrial planning is. In addition to environmental and economic aspects, the sea also plays a vital social role in human society. It provides space for recreational activities, preserves objects of historical heritage and serves as a symbol of cultural traditions for many coastal communities.

Administrative, geographical, economic and social specifics of countries and planned areas provide diversity of planning processes. All these parameters strongly influence organization of MSP processes, prioritization of planning goals and specifics of planning solutions. Thus, approaches to planning solutions for densely populated archipelago areas differ from those in open sea recognizing significant role of land-sea interaction. Also, the legal status of MSPs depends on national governance structure and legislation.

Development of the maritime sector of the European economy in the last decades has intensified human activities in the Baltic Sea, which in turn leads to competition for limited marine space between sectoral interests. However, the growing deficit of space in the sea is not the only problem as human activities affect the marine environment and exert pressures with respective environmental impacts. Even when the environmental impact of individual activities remains within acceptable limits, joint effects of such activities such as maritime transport with the development of respective infrastructure, extraction of sand and gravel, offshore energy, fisheries and aquaculture, recreation, and others might exceed the carrying capacity limit of the marine ecosystem and cause irreversible deterioration.

Accelerating climate change exacerbates the impact of human activities on the marine ecosystem. Human activities and corresponding pressures might not only limit the ability of the ecosystem to



adapt to changing climate but also reduce its natural capacity to mitigate climate change. In this context, the role of nature conservation and restoration has paramount significance. MSP should not only allocate sufficient space for nature conservation, protection, and restoration measures, but ensure connectivity and coherence of designated areas and consider their dynamics in time and space.

In order to address the complexity of marine nature, diversity of human activities and involved communities, and interdependence of all these components, MSP should consider the planning areas as a unified ecosystem. That is why an ecosystem-based approach is the solution which ensures sustainability of our seas, health of the marine ecosystem, and prosperity of different stakeholders.



### 3. Definitions of an ecosystem-based approach

The Convention on Biological Diversity (CBD) in 1992 included several principles and objectives that underpin the ecosystem approach and from which the approach originated. The ecosystem approach was further defined in the context of the CBD, particularly at the COP 2 held in Jakarta in 1995. There, the parties emphasized the importance of the ecosystem approach in biodiversity conservation and the promotion of sustainable use. Twelve principles of the approach were formulated at the Workshop on the Ecosystem Approach (Lilongwe, Malawi, 26-28 January 1998) and later identified at the Fourth Meeting of the Conference of the Parties to the Convention on Biological Diversity (Bratislava, Slovakia, 4-15 May 1998, UNEP/CBD/ COP/4/Inf.9).

Based on these principles, the Convention on Biological Diversity (CBD) (COP 5/Decision V/6), in May 2000, formulated the following definition of the ecosystem approach: "The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Thus, the application of the ecosystem approach will help to reach a balance of the three objectives of the Convention: conservation; sustainable use and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of many ecosystems."

HELCOM and the OSPAR Commissions adopted the following definition in a joint Meeting in June 2003: "The ecosystem approach can therefore be defined as "the comprehensive integrated management of human activities based on the best available scientific knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity"". In the HELCOM Baltic Sea Action Plan in 2007, the application of the ecosystem approach was adopted as the basis for all human activities, with particular emphasis on maritime spatial planning and fisheries.

The terms ecosystem approach in CBD and ecosystem-based approach in the EU framework are considered as synonymous and can be interchangeable.

In the EU policy ecosystem-based approach is defined by the Directive 2008/56/EU, known as Marine Strategy Framework Directive (MSFD). This Directive enacts that "by applying an ecosystem-based approach to the management of human activities while enabling a sustainable use of marine goods and services, priority should be given to achieving or maintaining good environmental status in the Community's marine environment, to continuing its protection and preservation, and to preventing subsequent deterioration". In line with MSFD, Article 4 of the EU Common Fisheries Policy considers the ecosystem-based approach to fisheries management as an integrated approach to managing fisheries within ecologically meaningful boundaries.

Article 5 of the MSP Directive (2014/89/EU) emphasizes that Member States, in their maritime spatial plans, contribute to the implementation of the ecosystem-based approach to maritime spatial planning and ensure consistency with the MSFD. This aims to ensure that the sustainability of marine ecosystems and ecosystem services is considered. The aim is also to ensure that human activities in



marine areas do not threaten the good environmental status of ecosystems and that their natural resources are used sustainably.

In the Baltic Sea Action Plan 2021 update, HELCOM recognized the importance of maritime spatial planning (MSP) and of applying an ecosystem-based approach to support BSAP objectives and targets and contributing to sustainable sea-based activities (HT12).

This Guideline considers the ecosystem as a base and humans as an integral part of the ecosystem. Consequently, the goal of human activities management by applying ecosystem-based approach is maintaining the ecosystem's functionality. This inclusive approach embraces various components of other EBA definitions such as sustainable development, nature conservation, and restoration, sustainable use of ecosystem services, maintenance of pressures withing ecosystem capacity limits, and achievement of good status of the marine environment. This approach recognizes that currently all ecosystems are affected by human activities. In most cases, the impact is negative, but it might also be a positive one. This also shows the importance of individual and collective responsibility for keeping a healthy functioning of the Baltic Sea environment.



## 4. Policy context for the ecosystem-based approach in MSP

### 4.1 Global framework

#### **United Nations Sustainable Development Goals 2030**

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

Goal 14 – Life below water – calls to conserve and sustainably use the oceans, sea and marine resources for sustainable development. The Goal integrates 10 targets addressing such urgent needs as reduction of all kinds of marine pollution, sustainable management of marine and coastal ecosystems, nature conservation and prevention of overfishing, minimizing of ocean acidification impact, increase of scientific knowledge and other. Progress towards the targets should be achieved through the implementation of the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources.

#### **The United Nations Convention on the Law of the Sea UNCLOS**

The United Nations Convention on the Law of the Sea UNCLOS was adopted in 1982. It lays down a comprehensive regime of law and order in the world's oceans and seas establishing rules governing uses of the oceans and their resources. UNCLOS primarily describes how sea-going vessels should interact with each other and with marine resources in regional waters and the high seas. UNCLOS defines everything from freedom of navigation to pollution and wildlife conservation. It also delineates maritime political and economic boundaries. The Convention stipulates organization of assessment of potential effects of planned activities if there are reasonable grounds for believing that the activities cause significant and harmful changes to the marine environment.

UNCLOS also serves as a framework for several agreements relevant to the application of EBA in MSP.

#### **Agreement on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ)**

This newly adopted High Seas treaty was introduced in January 2024 with 84 Parties to date. The BBNJ will be critical in order to achieve the 30x30 targets and includes packages on marine genetic resources, area-based management, environmental impact assessments, capacity building, and transfer of marine technology. Given its strong focus on increasing today's protected area coverage of about 1% in the High Seas (which cover about 64% of the world's oceans) to 30% by 2030 and thereby implementing the Global Biodiversity Framework (see below), it is a key treaty to integrate in MSP.

The Agreement stipulates conducting strategic environmental assessments for plans and programmes for activities beyond national jurisdiction. The goal of the assessment, which may be conducted



individually or in cooperation with other parties, is to collate and synthesize the best available information about the area or region, assess current and potential future impacts and identify data gaps and research priorities. The results of strategic environmental assessment (SEA) should be considered in environmental impact assessments.

The Agreement also identifies principles and approaches which should be applied to achieve its objectives, among which an ecosystem approach, an integrated approach to ocean management, precautionary principle and other.

### **The UN Fish Stocks Agreement**

The United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA) regulates key fisheries to conserve and manage straddling and highly migratory fish stocks. The long-term conservation and sustainable use of fish stocks of interest is supposed to be ensured through general principles, such as commitment to the precautionary approach and best available scientific knowledge. It furthermore provides the legal foundation for Regional Fisheries Management Organizations (RFMOs).

### **International Maritime Organization (IMO)**

The IMO is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships. The IMO includes area-based measures which are particularly relevant in the MSP context such as the designation of MARPOL Special Areas (the Baltic is one of these) with higher levels of protection than other ocean basins focusing on oil, sewage, garbage, and air pollution (via Emission Control Areas). A key spatial tool is "Particularly Sensitive Sea Areas" (PSSAs), which are intended to provide extra protection from shipping for ecologically, socio-economically and/or scientifically significant areas. The Baltic Sea Area has been designated as a PSSA. IMO governs shipping routes across the globe and is therefore a key tool to facilitate the rerouting of shipping lanes, for example to reduce the disturbance and/or negative impacts on wildlife (e.g. cetaceans). Good case studies exist under IMO where the risk of ship strikes for cetaceans could be reduced by moving shipping lanes or designating so-called "Areas-To-Be-Avoided".

Within the IMO context there are other relevant protocols such as the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, which are *inter alia* important to regulate matters which are directly relevant to MSP such as sediment management and dumping in the oceans.

### **The Paris Agreement**

Climate Change is one of the major crises of modernity. The Paris Agreement is a legally binding international treaty on climate change, entered into force on 4 November 2016. Its overarching goal is to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels." The Paris Agreement commits Parties to developing national climate action plans, known as nationally determined contributions (NDCs). In their NDCs, countries communicate actions they will take to reduce their greenhouse gas emissions and to build resilience to adapt to the impacts of climate change. By "noting the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity [...] when taking action to address climate change" the agreement raises the necessity to harmonize climate and biodiversity goals.



## **The Convention for Biological Diversity (CBD)**

The ecosystem-based approach emerged in the policy dialog in the 90s, when the Convention for Biological Diversity (CBD) at its second meeting, held in Jakarta, November 1995, adopted the ecosystem approach as the primary framework for action under the Convention. The ecosystem approach was identified as a strategy for the integrated management of land, water, and living resources, promoting conservation and sustainable use in an equitable way. Later in 1998 the twelve defining principles were adopted commonly known as the 'Malawi Principles':

- The objectives of management of land, water and living resources are a matter of societal choices.
- Management should be decentralized to the lowest appropriate level.
- Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.
- Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context, considering e.g. mitigating market distortions, aligning incentives to promote sustainable use, and internalizing costs and benefits.
- Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.
- Ecosystems must be managed within the limits of their functioning.
- The ecosystem approach should be undertaken at the appropriate spatial and temporal scales.
- Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.
- Management must recognize that change is inevitable.
- The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.
- The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.
- The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

## **CBD's Global Biodiversity Framework**

The Kunming-Montreal Global Biodiversity Framework ([GBF](#), decision 15/4) represents the most ambitious global agreement on biodiversity in the history of environmental governance and will serve as the world's framework for actions taken at all levels to safeguard and restore biodiversity. The framework supports the achievement of the Sustainable Development Goals and sets out an ambitious pathway to reach the global vision of a world living in harmony with nature by 2050. The framework has four long-term goals for 2050 related to the 2050 Vision for biodiversity. Goals A and Goal B are especially important for the application of ecosystem-based approach in maritime spatial planning:



Goal A: The integrity, connectivity and resilience of all ecosystems are maintained, enhanced, or restored, substantially increasing the area of natural ecosystems by 2050; Human induced extinction of known threatened species is halted, and, by 2050, the extinction rate and risk of all species are reduced tenfold and the abundance of native wild species is increased to healthy and resilient levels; The genetic diversity within populations of wild and domesticated species, is maintained, safeguarding their adaptive potential.

Goal B: Biodiversity is sustainably used and managed and nature's contributions to people, including ecosystem functions and services, are valued, maintained and enhanced, with those currently in decline being restored, supporting the achievement of sustainable development for the benefit of present and future generations by 2050.

The Framework includes 23 action-oriented global targets for urgent action over the decade to 2030 to enable progress towards long-term goals for 2050. The twenty-three targets to be achieved by 2030 include 30 per cent conservation of land, sea and inland waters (target 3), 30 per cent restoration of degraded ecosystems (target 2), halving the introduction of invasive species, integration of biodiversity in decision-making at every level (target 14) and \$500 billion/year reduction in harmful subsidies. Target 1 specifically addresses spatial planning.

Target 1: Ensure that all areas are under participatory, integrated and biodiversity inclusive spatial planning and/or effective management processes addressing land- and sea use change, to bring the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity, close to zero by 2030, while respecting the rights of indigenous peoples and local communities.

### **CMS - Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)**

CMS is a UN treaty with the aim of conserving transboundary wildlife. It is particularly relevant to ensuring ecological connectivity on land and in the sea. Species threatened with extinction are listed on Appendix I. Those species must not be harvested, bycaught, or otherwise taken and CMS Parties strive to strictly protect these animals, conserving and restoring their habitats, mitigating obstacles to migration and controlling other factors that might endanger them. Species listed on Appendix II have an unfavourable conservation status and are designated for strengthened international and regional cooperation, such as the conclusion of agreements. For example, the Baltic Proper population of the harbour porpoise (*Phocoena phocoena*) is listed on Appendix I. As a result of this CMS has evolved into a total of 7 regional agreements, 19 Memoranda of Understanding and five Special Species Initiatives. A number of these cover species in the Baltic, notably ASCOBANS (Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas)<sup>1</sup>, AEWA (Agreement on the Conservation of African-Eurasian Migratory Waterbirds), EUROBATS (Agreement on the Conservation of European Bat Populations), and the Memorandum of Understanding on the Conservation of Migratory Sharks (Sharks MOU).

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<sup>1</sup> Which covers the critically endangered Harbour porpoise (*Phocoena phocoena*) in close synergy with HELCOM and is active in MSP, for example through the development of guidelines for cetacean-sensitive MSP.



### **International whaling commission (IWC)**

The International whaling commission evolved from a global body responsible for the management of whaling to today focusing primarily on the conservation of whales. It provides regulations on key threats such as ship strikes, underwater noise, pollution, and by-catch. It is therefore directly relevant to MSP, notably via shipping, fisheries, naval/military use, tourism and extractives (e.g. oil, gas) sectors. Regarding the Baltic Sea, where the Baltic proper harbour porpoise (*Phocoena phocoena*) has reached a critically endangered status, there is emphasis in recent policy recommendations on urgently implementing bycatch mitigation and closures of relevant fisheries.

### **Ramsar Convention**

The Ramsar Convention is a global environmental treaty targeting wetland conservation. Through its site network it naturally has a strong area-based management component, as well as more recent policy aiming at strengthening connectivity within sites and across the network. In the Baltic catchment area, there are more than 170 Ramsar sites, including coastal and marine areas such as the Ingermanlandskieslets (Russian Federation). There is a wealth of guidance materials available, including the Ramsar Handbooks covering issues from monitoring to coastal management and international cooperation.

### **UNESCO World Heritage Convention (WHC)**

The UNESCO World Heritage Convention is an international treaty with the primary goals of nature conservation and the preservation of cultural properties – and therefore also with strong area-based components. UNESCO World Heritage Sites can be found across the Baltic region, such as the transboundary Kvarken archipelago shared by Finland and Sweden. These sites enjoy special protection status, which limits human encroachment as well as industrial activities, and thus directly impacts maritime spatial planning.

### **Espoo Convention - on environmental impact assessment in a transboundary context.**

The Convention, signed in 1991, is primarily aimed to reduce and control significant adverse transboundary environmental impact from proposed activities. It requires that environmental impact assessment, as a minimum requirement, be undertaken at the project level of the proposed activity and that the principles of environmental impact assessment are applied to policies, plans and programmes.

**Protocol on Strategic Environmental Assessment** to the Espoo Convention identifies the term SEA as the evaluation of the likely environmental, including health, effects of a plan or programme. According to the Protocol a strategic environmental assessment of plans and programmes which set the framework for future development that requires an environmental impact assessment under national legislation shall be carried out.



## 4.2 Regional (Baltic Sea) framework

**The Helsinki Convention** on the Protection of the 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. **The Baltic Sea Action Plan (BSAP)** is a strategic programme of measures and actions for achieving good environmental status of the sea, ultimately leading to a Baltic Sea in a healthy state.

The ultimate goal of the BSAP with respect to biodiversity and ecosystems is that the Baltic Sea ecosystem is healthy and resilient, which is supported by ecosystem-based management of human activities. The cumulative effects of existing and new activities on the marine ecosystem need to be evaluated, and an ecosystem-based approach implemented, where the carrying capacity of the ecosystem, and the need to set limits for human activities, is acknowledged.

In the BSAP, Contracting Parties to the Helsinki Convention underscore the need to integrate environmental objectives with socio-economic goals in order to advance sustainable development and stress the need for coherent spatial planning of human activities at sea across the region, applying the ecosystem-based approach. The BSAP recognizes that maritime spatial planning is a key and increasingly important instrument in ecosystem-based management and in working towards good environmental status. Hence, the BSAP provides a general framework for the ecosystem-based approach in the Baltic Sea region.

### **VASAB Vision for the Territorial Development of the Baltic Sea Region in 2040 (VASAB Vision 2040)**

VASAB - the intergovernmental cooperation for spatial planning and development in the Baltic Sea Region coordinates spatial planning both - on the land and in the sea. The VASAB Vision 2040 sets long-term perspective for terrestrial and marine planning and proposes respective potential future actions.

The Vision identifies a healthy nature securing the livelihood, production, and good quality of life as one of the highest priorities. It emphasizes the need for cooperative, transnationally, and cross-sectorial coordinated sea and land planning systems. The Vision prioritizes such future actions as

- New tools for evaluating dynamics and processes at the sea, with the objectives of protecting the sea and adaptation to coastal flooding and erosion enhanced by climate change.
- Ecosystem-based living on coastal areas and in archipelagos of Baltic Sea Region (BSR) aimed at promotion of sustainable blue economy with simultaneous restoration and protection of marine ecosystem.
- Functional coherence throughout the Baltic Sea, intended to strengthen the functional coherence in areas across borders developing a multi-use concept.

Regional BSR framework for application of EBA in MSP is formulated in several regionally agreed policy documents which are closely related to the above-mentioned BSAP. The ecosystem-based approach is one of the ten **“Baltic Sea broad-scale MSP principles”**, formulated by Baltic Sea countries in 2010 to guide maritime spatial planning and, thereby, to contribute to coherent MSP in the Baltic Sea. **The definition of ecosystem approach** was adopted by joint HELCOM and OSPAR Meeting in June 2003 as “the comprehensive integrated management of human activities based on the best available scientific knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of marine ecosystems, thereby achieving sustainable use of ecosystem



goods and services and maintenance of ecosystem integrity". The application of the precautionary principle is equally a central part of the ecosystem approach.

Further developing the broad-scale principles, Baltic Sea countries agreed on **the Regional MSP Roadmap 2013-2020** to draw up and apply maritime spatial plans throughout the Baltic Sea Region by 2020 which are coherent across borders and apply the ecosystem approach.

**The new Regional Maritime Spatial Planning Roadmap 2021-2030** has set a goal to strengthen the joint effort, and ensure coherence throughout the Baltic Sea Region, to implement Maritime Spatial Plans, aiming for sustainable development of the region and building a sound basis for an adaptive maritime spatial planning process applying an ecosystem-based approach.

## 4.3 EU legal/policy framework

### EU Maritime Spatial Planning Directive

**Objective** - when establishing and implementing maritime spatial planning, Member States shall consider economic, social and environmental aspects to support sustainable development and growth in the maritime sector, applying an ecosystem-based approach, and to promote the coexistence of relevant activities and uses.

The application of an ecosystem-based approach will contribute to promoting the sustainable development and growth of the maritime and coastal economies and the sustainable use of marine and coastal resources.

The aim is to ensure that the collective pressure of all activities is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised.

An ecosystem-based approach should be applied in a way that is adapted to the specific ecosystems and other specificities of the different marine regions and that takes into consideration the ongoing work in the Regional Sea Conventions.

MSP is a tool to support the application of an ecosystem-based approach to the management of human activities in order to achieve good environmental status of marine ecosystem.

In September 2021 the European Commission published **Guidelines for implementing an Ecosystem-based Approach in Maritime Spatial Planning**. The document intends to describe a practical aspect of an ecosystem-based approach in maritime spatial planning, including a method for the evaluation, monitoring and review of EBA in MSP. The guidance:

- presents an introduction to ecosystem-based concepts, principles and approaches.
- describes how work under the EU regulatory framework – including the MSFD) – provides resources for EBA in MSP.
- presents a set of key actions to integrate EBA in the main steps of the MSP process.
- describes potential tools that can be applied as part of operationalizing EBA in MSP.
- provides an approach to monitor, evaluate and review progress in integrating EBA in MSP.

Finally, the guidance illustrates recommendations with examples derived from MSP case studies as well as references for users to further explore when integrating EBA into MSP.

**The Marine Strategy Framework Directive** aims to achieve good environmental status (GES) of the



EU's marine waters and to protect the resource base on which marine-related economic and social activities depend. In order to achieve this goal, the Directive establishes 11 GES descriptors and European marine regions and sub-regions on the basis of geographical and environmental criteria. Regional Sea Conventions (RSCs) set regional environmental targets and coordinate Member States' actions, including also third countries in the same region or sub-region.

The purpose of **the Water Framework Directive** is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which contributes to the protection of territorial and marine waters and achieving the objectives of relevant international agreements. The knowledge provided by the WFD for land-based pressures on marine ecosystem is a part of the assessment of cumulative pressure.

**The Birds and Habitats Directives** provide data on protected marine habitats and species as well as on protected areas, specifically those designated as part of the Natura 2000 network. The Natura 2000 site management plans, in particular, should provide detailed information on ecosystems within their boundaries, and potentially in a broader geographical context.

Monitoring and reporting obligations under **the Common Fisheries Policy** will deliver information on fish stocks and landings, as well as the spatial distribution of fishing vessels (through VMS) that can help in assessing current state and pressures imposed by fisheries.

Since MSP applying the ecosystem-based approach ultimately aims to achieve good environmental status of the marine ecosystem, assessment of anticipated environmental effects of the plan is to be thoroughly considered. **The SEA Directive** establishes environmental assessment as an important tool for integrating environmental considerations into the preparation and adoption of plans and programmes. Since maritime spatial plans are likely to have significant effects on the environment, they are subject to Directive 2001/42/EC. The objective of this Directive is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development. According to the Directive, the environmental assessment shall be carried out during the preparation of a plan or programme and before its adoption or submission to the legislative procedure.

**The EU Climate Law** adopted in 2021 is primarily focused on the reduction of green-house emissions and achieving climate neutrality within the European Union (EU) by 2050. In this relation, the role of marine ecosystems, providing ecosystem services for carbon storage and renewable energy is of primary importance. EBA in marine special planning intends to ensure sustainable use of these services preventing deterioration of marine environment with subsequent ecosystem disfunction. The Law also aimed to enhance adaptive capacity, strengthen resilience, and reduce vulnerability to climate change, ensuring coherency of adaptation policies and their mutual support.

Urgent needs and obligations for restoration of ecosystems to mitigate the global biodiversity crisis were formulated in the recently adopted **EU Nature Restoration Regulation (NRR)**. The Law combines an overarching restoration objective for the long-term recovery of nature in the EU's land and sea areas with binding restoration targets for specific habitats and species. These measures should cover at least 20% of the EU's land and sea areas by 2030, and ultimately all ecosystems in need of restoration by 2050.

**The European Green Deal**, approved in 2020, is a set of policy initiatives by the European Commission to improve the well-being and health of citizens and future generations. The Green Deal involves several environmental policies addressing climate change, pollution, biodiversity and ecosystem health and restoration, including EBA related spatial objectives such as the designation of 30%

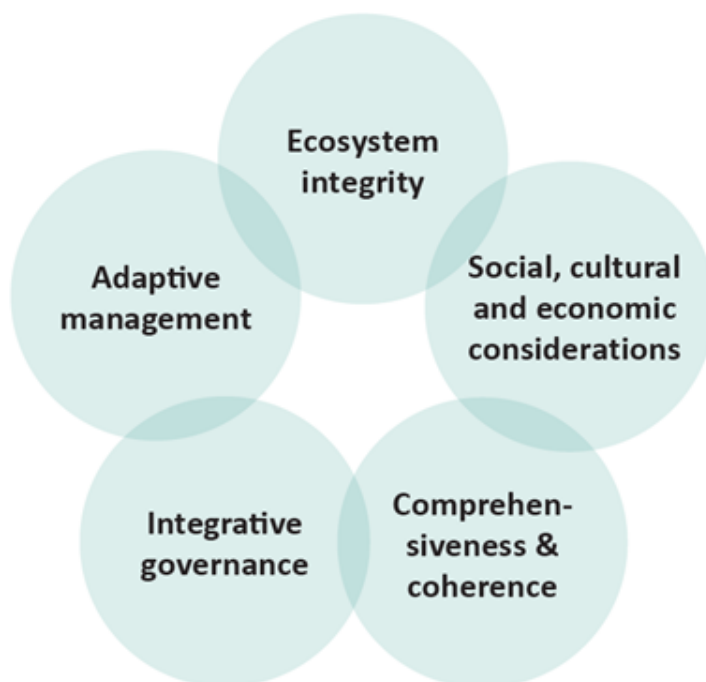


protected and 10% strictly protected areas embedded in the EU Biodiversity strategy. In the conclusions of the European Commission Report outlining the progress made in implementing Directive 2014/89/EU establishing a framework for maritime spatial planning (COM (2022) 185), MSP is considered as a powerful enabler for the European Green Deal. Furthermore, Member States will need to continue to reflect the ambitions of the European Green Deal in their maritime spatial plans, and to align their plans with these ambitions. The Report points out that future maritime spatial plans will have to cater for cumulative impacts of anthropogenic pressures by applying an ecosystem-based approach.

**The European Union Strategy for the Baltic Sea Region (EUSBSR)** is the first of the four Macro-regional Strategies in Europe. The Strategy is an agreement between the Member States of the EU and the European Commission to strengthen cooperation between the countries bordering the Baltic Sea. The Strategy is divided into three main objectives: saving the sea, connecting the region, and increasing prosperity. Actions needed for the achieving of the Strategy's objectives are formulated in an action plan, which is implemented by fourteen policy areas. Policy Area Spatial planning aims for territorial cohesion in the Baltic Sea Region by 2030, when the Region shall be better integrated and coherent macro-region. To achieve that, PA increases the knowledge on land-based spatial planning in the BSR and aims for coherent maritime spatial planning throughout the BSR, applying an ecosystem-based approach.

## 5. Key elements of the ecosystem-based approach in MSP

Five key elements of the ecosystem-based approach presented on Figure 1 are intended to systematize practical application of the EBA in MSP to ensure sustainable development of planning areas and the entire region. They are derived, primarily from the definition of ecosystem-based approach, however, addressing major EBA principles formulated in global and regional framework of EBA in MSP. These five key elements should be integrated into all stages of the maritime spatial planning process. These elements can be in future utilized to evaluate and follow up the implementation of EBA in MSP. This section provides short definitions and main features of each element to consider in the development of maritime spatial plans



**Figure 1.** Five key elements of the ecosystem-based approach.

1.1. **Ecosystem integrity** - conserving and restoring nature, and retaining cumulative impacts within ecological carrying capacity.

- *Conservation.* The EU Biodiversity Strategy requires at least 30 percent of the EU marine area to be designated for nature conservation purposes by 2030, 10 percent of which should be strictly protected. MSP should consider and integrate, to the extent possible, spatial conservation measures to deliver in relation to this target as well as to protect habitats and species under the Birds and Habitats Directive, and contribute to achieving Favourable Conservation Status (FCS) and good environmental status (GES) under the Marine Strategy Framework Directive.



- *Restoration.* MSP should deliver in relation to the target set by the recently proposed Nature Restoration law, ensuring that 20 percent of the sea area is designated for restoration measures. MSP should have a role in the enhancement of these habitats and their connectivity, aiming for achievement of a good environmental status.
- *Ecological carrying capacity.* MSP should contribute to restraining pressures within the ecosystem's capacity limits, safeguarding its natural functions. This requires early and careful consideration of single and cumulative impacts, development of alternative planning solutions and mitigation measures.
- *Good environmental status (GES).* Good environmental status (GES). MSP should, within its remit, contribute to the overall achievement of the good status of the marine environment in the planning area through allocating and coordinating human activities, keeping pressures within the ecological limits. The contribution of planning solutions to GES should be assessed during the planning process utilizing respective MSFD descriptors and HELCOM indicators as much as justifiable based on the best available scientific evidence.
- *Relational understanding.* Various effects on the ecosystem caused by human activities as well as interactions between them and the ecosystem should be considered. This includes direct/indirect, short/long-term, permanent/temporary and positive/negative effects.
- *Cumulative effects.* Planning should consider the joint effect of, and interaction between, different pressures. Cross-border/transboundary consultation is an important tool to determine cumulative effects and assure coherence between MSPs across sea basins in order to preserve ecological integrity.
- *Mitigation measures* -a complex of measures should be envisaged to prevent, reduce and as fully as possible offset any significant adverse effect from maritime activities on the marine environment.

1.2. **Social, cultural and economic considerations** - utilization of ecosystem services and incorporating relevant human activities.

- *Humans as part of the ecosystem.* MSP solutions should explore the positive linkages between environment, economy, and social dimensions. A synergy and conflict matrix could be an efficient tool to display interactions between interests.
- *Ecosystem services.* Mapping and assessment of ecosystem services, through e.g. the Common International Classification of Ecosystem Services (CICES), and *ecosystem accounting* should be based on the best available knowledge of ecosystem components, their condition and produced social and economic benefits and values.
- *Cultural elements.* Identification and assessment of tangible and intangible values related to past and present sea uses, such as shipping or fishery, should be recognized in MSP to support their existence and viability in the long term. The tangible values are related to different underwater (e.g., wrecks) and coastal (e.g., lighthouses) elements that are often recognized as cultural heritage monuments. Intangible values, such as practices, traditions, skills of craftsmanship, and knowledge that form individual, group, or



community values, should also be respected within MSP by mapping culturally significant areas. Cultural values may play an important role in tourism and recreation development and be part of the assessment of cultural ecosystem services.

### 1.3. **Comprehensiveness and coherence** - cross-border and cross-sectoral consideration.

- *Comprehensive knowledge.* The best available scientific knowledge should be fully applied in the development of planning solutions. Spatial data on nature values, pressures as well as social and economic values should be synthesized at an early stage to identify knowledge gaps and organize targeted research to bridge them.
- *The Precautionary principle.* Recognizing the limitations of the best available knowledge is equally important as making use of it. Planners are recommended to consider uncertainties related to the assessment of the true impacts of human activities, and make conservative decisions when uncertainty is high. Uncertainties related to changing climate parameters increase the importance of a precautionary approach.
- *Land-sea interaction.* Maritime activities are not the sole sources of pressure for the marine environment; significant impacts also originate from land-based sources. While organization of land-based activities is beyond the scope of MSP, the effects of these activities still need to be considered in the assessment of cumulative pressures.

### 1.4. **Integrative governance** - multi-level governance and aligning strategic policy goals and national or regional commitments with ecological objectives and targets.

- *Coordination.* Cross-sectoral and multi-level transparency of the planning process strengthens sharing of the best knowledge, accounting for sectoral, national, and local interests, broad acceptance of planning solutions and resolving potential conflicts. Awareness raising and education should become a tool to build trust between stakeholders.
- *Subsidiarity.* Maritime spatial planning with an ecosystem-based approach as an overarching principle shall be carried out at the most appropriate level, however, seeking coherence between different levels.
- *Participation.* Relevant authorities, stakeholders and the wider public should be involved at an early stage in the planning process. They can be identified in national legal acts or through a Public Participation Strategy. Participation can be organized through Community of Practice (CoP) workshops, sectoral (thematic) and/or integrative meetings, or individual consultations.
- *International cooperation.* Regional Sea Conventions such as HELCOM and OSPAR, as well as the EU through e.g. the Marine Strategy Framework Directive and the Maritime Spatial Planning Directive, serve as platforms to coordinate planning and management of cross-border pressures and ecosystems. Consultations under the ESPOO Convention also offer opportunities to address anticipated impacts of MSP across borders.



1.5. **Adaptive planning** - forward looking approach and adaptation of planning solutions to emerging challenges.

- *Integrated approach.* Feedback from impact assessments should be incorporated in the planning process through iterative revision and evaluation of goals and planning solutions.
- *Climate change.* MSP should address adaptation to climate change by e.g. identifying climate refuges, restoration areas, coastal protection and climate mitigation through areas for renewable energy and carbon sequestration functions of the ecosystem.
- *Monitoring & evaluation.* Changes in the state of ecosystems, societal and economic demands, as well as a growing scientific evidence base should be recognized in the MSP process. Monitoring of environmental, social, and economic effects of plan implementation should lay the basis for adaptive management of human activities and highlight implementation gaps, through regular or continuous plan revision.
- *Alternative development.* Alternative scenarios should be considered, and reasonable alternative solution developed to avoid or reduce negative environmental and other impacts as well as impacts on the ecosystem goods and services.



## 6. Available knowledge and data

The best available knowledge is one of the pillars supporting ecosystem-based maritime spatial planning. A comprehensive knowledge base should be built integrating scientific evidence with local knowledge and sector-specific expertise. This comprehensive knowledge has to be compiled in the process of defining the content of maritime spatial plan. The knowledge should in general cover four major areas:

- description of the marine environment,
- state of the ecosystem and its ecological components,
- human activities, socio-economic and cultural aspects, including well-being,
- and pressures, the impact of human activities on the ecosystem including cumulative impacts.

### 6.1 Description of the marine environment

A comprehensive national study of marine areas in general should include:

- hydrological and geological information, as well as physical and chemical parameters,
- information on distribution of species and habitats.

This information should be compiled in aggregated cartographic data catalogue e.g. called “marine green infrastructure”, “blue-green network”. Generated spatial data should be utilized to produce maps demonstrating aggregated nature values. Furthermore, specific habitat functions (e.g. migratory corridors, nursery areas, resting/overwintering areas, moulting areas, etc) should be displayed.

Ecologically significant marine areas, including potential areas for ecosystem services, are to be identified. Ecologically significant marine areas should account for biodiversity, sensitivity and uniqueness of biotopes, geological diversity and areas in natural state. Scientific Criteria for identifying ecologically or biologically significant marine areas (EBSAs) developed by the Convention on Biological Diversity might be applied to select valuable areas. Other criteria that can be used are those for the identification of Important Marine Mammal Areas (IMMAs) developed by the IUCN Marine Mammal Protected Areas Task Force).

A coherent network of marine protected areas (MPAs) is one of the vital components of the marine nature conservation system. Spatial data on MPAs as well as information on targeted protection species and biotopes should be thoroughly compiled and considered in the planning process. However, since MPAs are already legally regulated at national or even international level they are not necessarily reflected on plans but used as background information for planning human activities, even outside MPAs, and considering their potential impact on protected species and biotopes.

### 6.2 State of the marine ecosystem and its components.

Since delivering good environmental status and maintaining pressure within the ecosystem capacity limits are the goals of ecosystem-based approach in MSP, the state of the marine ecosystem and its components should be identified as a baseline for planning. The assessment of the state of the marine



environment should in general correspond to the system of descriptors provided by the EU Marine Strategy Framework Directive, Habitat Directive and Birds Directive but, at the same time, it can be tailored for the specific geographical and social-economic conditions of the planned area, addressing regional environmental objectives (e.g. HELCOM BSAP). In general, knowledge and data on the state of the marine ecosystem should cover the following key themes: biodiversity, eutrophication, chemical contamination, marine litter, level of underwater noise and vibration, sea floor integrity (e.g. HELCOM HOLAS 3).

A set of indicators is to be applied for qualitative assessment of the state of the marine environment. These indicators should be based on the best available knowledge obtained through scientifically justified monitoring programme and apply regionally agreed threshold values and MSFD criteria identifying good status of marine environment. The indicators should also provide a mechanism to address the effect of planning solutions and serve as a basis for adaptive management.

### 6.3. Human activities and socio-economic aspects

Information on human activities at sea, especially those which cause pressure on the ecosystem, should be compiled involving stakeholders possessing respective competence. This information should be georeferenced, demonstrating spatial distribution of respective activities and their current intensity. Since maritime spatial planning is a forward-looking process, information on temporal variations of human activities is of high relevance and should be compiled wherever possible. Data on human activities should in general include:

- ship traffic,
- construction including cables and pipelines, dredging and depositing of dredged material,
- extraction of mineral resources,
- defense,
- extraction of living species (e.g. fisheries),
- energy production,
- aquaculture,
- tourism and recreational activities.

Each category can be further specified, tailored for specific geographic and social-economic conditions. A future projection based on observed temporal and spatial variations of human activities could be utilized as “zero alternative” in the assessment of plan’s environmental and economic impact.

### 6.4. Pressures and impacts

Information on pressures is preferably derived directly from monitored or modelled pressure data. However, in cases when no direct data is available, the spatial distributions of these pressures can be estimated indirectly based on human activities associated with them. Some human activities cause multiple pressures, so careful mapping of human activities and pressures should be performed. A matrix could be utilized as a basis for mapping human activities and related pressures. Then pressures originating from associated human activities are to be aggregated at basin scale and respective



cartographic materials illustrating spatial distribution and intensity are produced. In general, pressures under consideration should include (Annex with examples from HOLAS 3, HOLAS 3 ref):

- biological and physical disturbance,
- input of energy, including underwater noise,
- input of substances,

These pressures should be further specified for respective sea areas or basins. Pressures originating from land-based activities are to be accounted for and thoroughly mapped.

Spatial distribution of potential cumulative pressure can be computed by summarizing individual pressures. The results will provide information about the location of areas with the highest potential cumulative pressures, without assessing their specific interactions with species or habitats. The distribution of potential cumulative pressure provides a baseline for integrated management of human activities at sea; however, it might not correspond to the areas with high impact on species and habitats.

The pressures of human activities result in a change of the state which in turn impacts the status of the biodiversity or health and thus affects the potential to deliver ecosystem services and benefits for human well-being. For some pressures, impacts on environment are straightforward. For example, an increase of nutrient pollution load leads to increased concentrations, which accelerates algae growth thereby potentially leading to changes in habitats. Similarly, extraction of mineral resources (e.g. sand and gravel) courses disturbance or losses of benthic habitats thereby affecting multiple species that depend on these habitats. In most situations, it could be more challenging since a clear connection might not be immediately apparent. Sensitivity matrix should be employed in cumulative impact assessments as a basis to establish the connections between the various pressures and components of the ecosystem. Potential individual impacts of specific human activities on sensitive (including rare) species should be mapped (sensitivity mapping) and properly addressed applying precautionary principle.

Due to the dynamic nature of marine waters, it is likely that multiple pressures coincide in the same marine location or affect the same vulnerable species, thus resulting in significant cumulative impacts. Further on, it is important to note that the majority of impacts are observed with a time lag. The HELCOM Spatial Pressure and Impact Assessment demonstrates how the spatial distribution and intensity of different human activities and pressures, using the best available knowledge on the sensitivity of ecosystem components to these pressures, can be used to quantify their combined pressure and impacts on the environment.

Targeted studies are to be launched to obtain missing data and scientific evidence to underpin the maritime spatial plans and allow for specific activities at sea to take place. Monitoring programmes should be established to identify pressures and impacts caused by specific human activities for which development is prioritized.

## 6.5. Cultural values

A comprehensive knowledge base on cultural values integrates national and international georeferenced data and information, complemented by local knowledge and assessments. Underwater and coastal cultural heritage, including monuments and sites, is identified and registered



under national and international cultural heritage protection laws. Databases (registers) of these sites are maintained by national heritage authorities. In addition to tangible heritage, intangible cultural values—such as traditional fishing and fish processing practices, craftsmanship skills (e.g., shipbuilding, fishing gear/tool crafting), and community knowledge of coastal history—should also be integrated into MSP, for instance, by identifying culturally significant areas. If such data and information is unavailable, dedicated studies or stakeholder participation processes are encouraged to collect and document it.

Results from mapping and assessing of cultural ecosystem services add another layer of spatially explicit data, showing the benefits that marine and coastal ecosystems provide to society. Information on cultural ecosystem services emphasizes the non-material contributions of ecosystems to human well-being, including physical, experiential and intellectual interactions with landscapes, seascapes, and their distinct qualities. To ensure comprehensive and comparative assessments, standardized approaches such as the Common International Classification of Ecosystem Services (CICES) or Ecosystem Service Accounting should be applied. These frameworks allow for the mapping and assessment of ecosystem services across biophysical, social, and monetary dimensions.

## 6.6 A reference list of data recommended for consideration applying an ecosystem-based approach in MSP

Thematically, data used in MSP can be aggregated in six groups (cf. Annex 1):

1. administrative division,
2. data on ecosystem components,
3. data on human activities,
4. data on pressures,
5. socio-economic data, and
6. cultural data.

It is not intended to provide an exhaustive list of data used in MSP. However, data describing various subjects should be considered to highlight the diversity of their technical characteristics and, subsequently, methods of their processing and visualization. Compilation and efficient use of data produced under various policies (especially MSFD) is highly beneficial for the application of EBA in MSP. Data is important for developing policy-relevant indicators which reflect causal-effect relationships in the context of MSP.

**Data on administrative division** (1) primarily describes borders of various administrative units and zones. **Data on ecosystem components** (2) covers a wide spectrum of information on physical, chemical, and biological parameters of planning areas. This group includes geological and hydrological parameters, distribution of species and biotopes and other data required for comprehensive understanding of natural conditions of the planning areas.

**Data on human activities** (3) represents information on existing installations, underwater infrastructure, areas designated for various economic activities (fishing fisheries, tourism, offshore energy, etc.) as well as areas licensed for geological exploitation, reserved for nature conservation and restoration, and cultural heritage. Another type of data on human activities describes functional zones designated for the development of human activities in the future.



Human activities potentially exert **pressures** (4). They result in physical disturbance or destruction of the ecosystem components, physical and chemical inputs to the environment and extraction of living organisms. The data describes their distribution and in combination with data on distribution of various ecosystem components serve as a basis for the assessment of environmental impacts. Regional data sharing platforms such as Basemaps or European ones such as EMODnet allow for the availability and reusability of such data.

**Socio-economic data** (5) is a large mass of auxiliary information characterizing stakeholder groups and societal needs. It includes such parameters as population density and distribution, cultural and social groups, and employment.

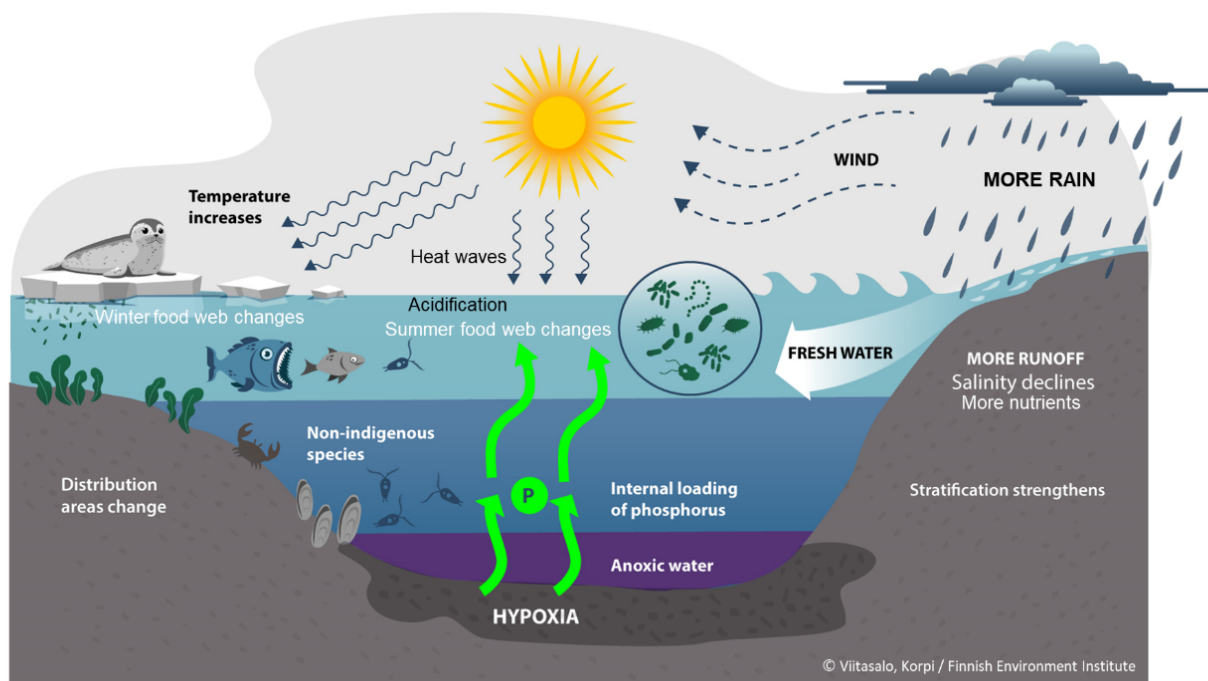
**Marine and coastal cultural data** (6) can be considered to comprise both cultural ecosystem services (CES) and cultural heritage, integrating both intangible and tangible aspects of human interactions with marine environments.

The reference list (Annex 1) does not reflect the data which should be used for ecosystem-based MSP but could be utilized as a pickup list tailored for specific geographical, social, cultural and economic conditions of planning area.

## 7. MSP for increasing climate change resilience

Climate change is progressing, and it is expected to cause multiple, severe changes in the global environment and marine ecosystems. Overviews of climate change consequences for the Baltic Sea region are available in the [HELCOM Climate fact sheet](#) (e.g. pages 6-9) and the Baltic Earth Assessment Reports ([BEAR](#)) from 2022.

A combined effect of physical and chemical changes is that marine ecosystems will undergo structural and functional alterations, and species will experience shifts in their geographical ranges, including seasonal variations. While the exact ecological repercussions of climate change, timescales and impacts in specific locations cannot be predicted with full certainty, a redistribution and change of marine habitats and ecosystems will take place. These effects will increase vulnerability of marine ecosystem and lead to redistribution and, potentially, loss of marine ecosystem services, which might have negative economic and social consequences. Sea level rise and expected increase of extreme weather events will also negatively affect coastal settlements and livelihoods in different sectors. Major physical and ecological climate change consequences are visualized in the scheme.



**Figure 2.** consequences of climate change in the Baltic Sea marine environments (source: Markku Viitasalo and Marianna Korpi, Finnish Environment Institute).

**Climate-smart MSP** is a term used to describe approaches in MSP that integrate climate change considerations into planning evidence, support efforts to reduce or store greenhouse gases (mitigation) and help to reduce negative impacts of climate change (adaptation) with an overall aim of strengthening resilience of marine ecosystems, maritime sectors and coastal communities.



Since ecosystem-based approach considers humanity as an integral part of the ecosystem, climate change process in general and, particularly, its anthropogenic component, should be considered at all stages of MSP process. Furthermore, ecosystem-based approach in MSP, considering nature value and social-economic benefits in equitable way, gives a unique opportunity for a holistic approach needed for inclusion of climate change considerations into MSP. Climate change mitigation and adaptation actions in MSP can be designed to utilize the ability of the marine ecosystem to store carbon and to mitigate climate change effects through ecosystem services provided by the marine ecosystems. It also concerns the natural ability of marine ecosystem to adapt to changing climate parameters, which is to be supported by respective spatial nature conservation and restoration measures.

In the light of changing climate parameters **ecosystem integrity** becomes a vital component in the planning process. A healthy functioning ecosystem not only keeps natural adaptation ability. Carbon-rich ecosystems also serve as natural carbon storage. However, maintenance of ecosystem resilience requires specific nature conservation, restoration, and nature-based solutions as well as allocation of areas for climate refugia. At the same time, potential positive impacts of climate change on the ecosystem should not be neglected.

Climate change has significant **social and economic** effects and affects **cultural aspects** of society. Adaptation to climate change should consider coastal defense, storm risks management as well as cumulative effects in relation to climate change. Marine areas provide broad opportunity to mitigate anthropogenic factors of climate change providing resources for renewable energy. However, the use of marine space for wind and other renewable energy production should also be planned in an ecosystem-based approach respecting both nature value of the marine ecosystems and social equity. Climate-smart MSP, applying an ecosystem-based approach should foster and utilize ecosystem services including carbon sequestration in an equitable way.

Cross-sectorial and cross-border **comprehensiveness and coherence** are required addressing all aspects of climate change in climate smart planning solutions. The solutions should be based on the best available knowledge on climate change's impacts and threats as well as sectorial development and adaptation. A comprehensive dialogue with scientists (climate scientists, oceanographers, economists, social scientists and engineers) should be launched to gather knowledge on where we with climate change are and where we are most likely going to. Such dialogue needs to include policymakers, different sectors administrations and stakeholders to create a common understanding of the situation, possible impact mechanisms and vulnerabilities, and most importantly options and measures to mitigate and adapt to climate change. The weight of precautionary principle grows in the light of additional uncertainties caused by climate change.

Multi-level governance as a key component of **integrative management** is an instrument which helps to engage various stakeholders in a joint effort to increase climate change resilience but also channels global goals to local level. This an important function of climate-smart MSP since most of the climate change related goals have global character, while mitigation measures are undertaken at local level. Integration of the climate mitigation and adaptation perspectives in a coherent manner across all marine policies and sectors will support inclusion of climate perspectives into MSP.

Ecosystem-based MSP is a forward-looking process involving **adaptive management**. This is also the key element of climate-smart MSP. Furthermore, countries in the Baltic Sea region are already planning areas for offshore renewable energy production and transmission showing the MSP practice is already evolving towards climate-smart MSP. Climate change is recognized as a megatrend<sup>2</sup> that will affect the future developments in multiple ways and for a long time. It will affect the marine

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<sup>2</sup> WELCOME TO 2030: THE MEGA-TRENDS (<https://ec.europa.eu/assets/epsc/pages/espas/chapter1.html>)



environment as well-as the future of human activities that MSP is planning. This means that the capacities and practices of anticipatory and adaptive planning need to be further strengthened.

General recommendation for building a climate-smart and ecosystem-based MSP can be summarized as follows:

- Coordination is needed across all maritime sectors to make national, sea basin and EU ocean governance climate-smart as a whole. MSP can do a lot, but not everything, and climate-smartness needs to be included across sector policies in a consistent way.
- It is imperative to look beyond national borders and collaborate at sea basin level.
- The private sector is already under way with important steps towards climate neutrality. Utilize that knowledge and support that development through MSP.
- Foster a consistent climate-aware narrative also through MSP processes and communication.
- Strengthen capacity in anticipatory and adaptive MSP to support climate resilience. This requires a holistic perspective, in which adaptation and mitigation actions are complementary rather than alternatives.
- Ecosystem-based MSP is the cornerstone of climate-smart MSP.
- Include climate change related indicators into monitoring and evaluation of MSP and follow up progress towards climate-smartness.



## 8. Maritime spatial planning process and ecosystem-based approach

Maritime spatial planning is commonly understood as a public process for analyzing and planning the spatial and temporal distribution of human activities in sea areas to achieve economic, environmental and social objectives. In 2014, the EU adopted Directive 2014/89/EU on maritime spatial planning (MSP) (hereafter the “Directive” or the “MSP Directive”) to achieve effective management of maritime activities and sustainable use of marine and coastal resources, based on an ecosystem approach. The MSP Directive creates a framework for consistent, transparent, sustainable and evidence-based planning decisions.

The definition of MSP identifies its complexity as a process serving for achieving triple objectives - economic, environmental and social – in an equitable way. It requires holistic consideration of both human activities and the environment as well as their relations. In this context an ecosystem-based approach to planning process is regarded as the only solution, since it considers humanity as an integral part of the ecosystem. It leads to understanding that the whole ecosystem, including humans, should remain functioning. And that human activities are managed in a way that exerted pressures do not compromise the state of the environment either jointly or individually.

Organizationally, maritime spatial planning is a complex process. It involves stocktaking of policy objectives, compilation of information about the environment, human activities and human pressures, development of planning solutions, assessment of anticipated impact of the plan and monitoring of the effects of plan’s implementation with respective adjustment if necessary. Since MSP is identified as a public process, public discussion or communication with stakeholders are to be organized at each stage of planning, ensuring availability of the best expertise and consideration of all interests. All these activities are closely interconnected and the whole planning process is iterative and circular, while the specifics of its organization depend on national governmental structure and legislation.

Land-sea interaction cannot be neglected in the planning process. It concerns not only pressures originating from land-based sources in the assessment of the state of the marine environment but also certain synchronization of terrestrial and maritime spatial planning processes. This issue is differently addressed in Baltic Sea countries. In some cases, MSP is regarded as an extension of terrestrial planning regimes, while other countries have developed separate MSP legislative frameworks.

For this Guideline, planning process is divided into four major consecutive stages, which are common for all Baltic Sea countries: 1) Goals’ setting and revision, 2) Defining plan content, 3) Evaluation and impact assessment, and 4) Adoption, monitoring & evaluation. However, these stages are inherently interdependent and therefore cannot be considered in isolation. The fifth stage - participation and interaction -, regarded as an integral part of the participatory planning process, can’t be considered as one of the consecutive stages but rather as a continuous activity during the whole planning and beyond.

**Goal setting and revision** stage, in general, includes stocktaking of relevant policies, organization of cross-sectorial discussion and setting of planning goals and objectives. In addition, the organizational structure of MSP process is set at this stage, and specific knowledge gaps which need dedicated studies are specified. Theoretically, the goals and objectives can be further revised in the course of



planning. However, it is not a common practice since these goals and objectives are largely controlled by national legislation and political priorities.

**Defining plan content** involves compilation of data and the best available knowledge on the marine environment, human activities and pressures, including obtaining the results of dedicated studies. Planning solutions developed at this stage intend to achieve planning goals and resolve potential conflicts between sea users. Future orientation of the plan requires accounting for potential changes of either natural (climate change) or social and economic parameters, which might require the development of several planning scenarios.

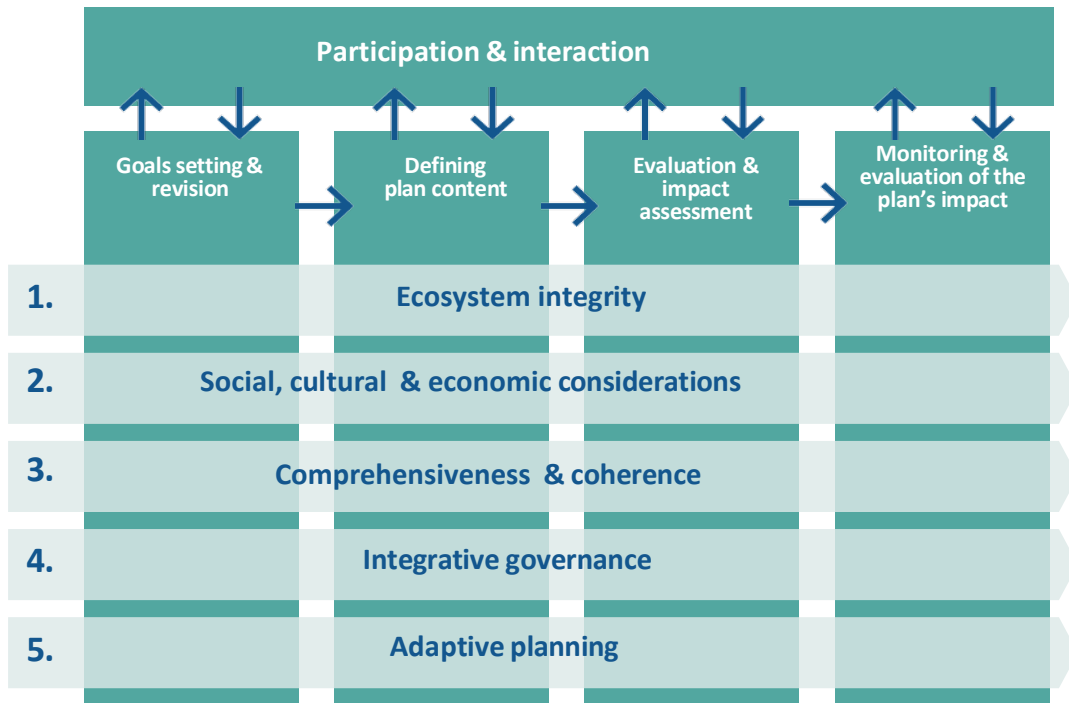
**Evaluation and impact assessment** (strategic environmental assessment) is a mandatory part of the planning process. At this stage potential environmental, social and economic impacts of planning solutions are assessed against the set goals. Cross-sectorial and public discussion of the assessment results intended to reveal potential drawbacks of the proposed solutions and agree on the most suitable planning scenario. The assessment results together with the results of public discussion should be iteratively integrated in the plan's content and might also affect planning goals and objectives resulting in their adjustment. The result of impact assessment might also reveal the need for additional dedicated studies.

**Monitoring and evaluation** of the plan's impact after its adoption is crucial to demonstrate that planning solutions are fit towards achieving the set goals and objectives. This is an integrative process which utilizes various data collection instruments such as environmental monitoring, economic and social statistics, social studies and policy reviews. Deviation from the envisaged development scenario might need an urgent change. These changes might also be caused by changes of natural parameters as well as political and economic objectives.

Procedures for adoption of national maritime spatial plans strictly prescribed by national legislation. Moreover, they largely depend on the MSP status, which largely differs between countries (in some countries MSPs are legally binding, in others they are recommendations). It makes developing any common practical recommendations for the MSP adoption procedures extremely difficult. However, from EBA perspective the adoption should be preceded by thorough consideration of the results of strategic environmental assessment, public discussion and cross-border consultations, ensuring transparency of the decision-making process. It is also desirable that a monitoring and evaluation programme is adopted together with the plan.

**Participation and interaction** are continuous throughout the whole planning process, including monitoring and evaluation of plan's impact. It involves organization of interaction between respective authorities, cross-sectorial dialog, intergovernmental consultations and public discussions. In addition to overall transparency of the planning process, it is intended to ensure interests of all potential stakeholders' groups, comprehensiveness of knowledge, reliability of data and cross-border coherence of planning solutions. This is also a tool for multi-level communication which channels global goals to local management level and feedback in reverse way.

Application of an ecosystem-based approach in maritime spatial planning requires consideration of all five key EBA elements at each planning stage as it is demonstrated at Figure 3.



**Figure 3.** Planning stages and key EBA elements.

The following sections of the Guideline are intended to provide practical recommendations on the application of EBA in MSP for each of these major processes, demonstrating their deep interconnection. The guidance for each process is supposed to address five key EBA elements, demonstrate the use of the best available knowledge and serve for the achievement of ultimate goal of EBA in MSP – keep pressures within the marine ecosystem carrying capacity limits and maintain its healthy functioning.

## 8.1 Goals' setting and revision

Planning goals are set at the initial stage of the planning process. They are defined primarily by national legal base, national strategic marine policy documents and nature protection objectives specified in international agreements. According to the EU MSP Directive, maritime spatial planning is aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources. In other words, MSP as a tool is designed for the achieving of social and economic goals in sustainable way, which, according to the ecosystem-based approach, requires a balance with environmental goals. Thus, despite goals related to nature conservation, restoration and achieving of good environmental status of respective marine basins are set under other policies they are to be considered at the goal setting stage of MSP process. In this regard, MSP Directive directly requests that the preservation, protection, and improvement of the environment, including resilience to climate change impacts are considered by Member States as MSP objectives. Application of ecosystem-based approach in MSP strives to consider above mentioned goals in equitable way and this Guidelines provide practical recommendations on how it can be achieved.



**Incorporating Relevant Legislation and Strategies.** For effective ecosystem-based MSP, it is critical to take into account relevant legislation and strategies concerning ecosystems, environmental and environmentally relevant programs, plans and agreements as well as CBD, EU, HELCOM and national targets:

- For the identification of environmental goals, follow the definition of good environmental status under the MSFD (2008/56/EC) and BSAP (2007) and good ecological status under the WFD (2000/60/EC). This ensures that implementation of the maritime spatial plan will be compatible with the achievement of good environmental status under these directives and under the BSAP.
- Integrate both short-term and long-term strategic ecological objectives, with a particular focus on the BSAP. This involves prioritizing areas that are crucial for protection, emphasizing their ecosystems' ability to recover from human-induced stress and maintain good environmental status.

**Good environmental status.** National MSPs, applying an ecosystem-based approach, are intended to support and promote the delivery and maintenance of good environmental status (GES) of marine ecosystem. That's why close connection of planning goals with objectives set under the Marine Strategy Framework Directive is one of the key elements of the goal setting process. This requires consideration of spatially related good environmental status objectives, developed under respective policies, that can be supported by MSP.

**International policy agreements.** Regional Sea Conventions coordinate the effort of Contracting Parties to protect the marine environment, identifying specific environmental goals for respective basins. It serves for coordination of the implementation of the EU MSFD within the basins tailoring its goals for specific geographic and socio-economic conditions. In the Baltic Sea region regional GES objectives are set under regionally harmonized policies - the Baltic Sea Action Plan 2030 and related documents (e.g. Regional Action Plan on Marine Litter RAP ML or Regional Action Plan on Underwater Noise RAP NOISE). Strategy of the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic 2030 largely identifies environmental goals for the North Sea region with respective specification in sectorial action plans (e.g. RAP ML) and other acquis. ASCOBANS Resolution 10.5 *Maritime Spatial Planning provides Guidelines for Cetacean-sensitive Maritime Spatial Planning for the ASCOBANS Area*, which can be adapted to other areas, including high-level recommendations that Parties are requested to implement when reviewing and/or updating their national MSP. These spatially referenced environmental goals should be considered at the goal setting stage of spatial planning applying the ecosystem-based approach.

**Biodiversity.** Planning goals should be set striving to deliver nature conservation targets set under the EU GD Biodiversity Strategy which requires 30% (including MPAs and OECMs) of the EU marine area to be designated for nature conservation purposes with 10% of strict protection. Planning goals setting should consider marine areas for the implementation of other effective spatial conservation measures aimed to protect habitats and species identified under EU Birds and Habitats Directives and the goals should be tailored for individual sea basins accounting for specificity of their habitats and species (action B1 of BSAP2030). Planning goals should take into account the requirement of the Biodiversity Strategy ensuring that 30% of EU protected species and habitats are in favourable conservation status or have positive trends by 2030.



**Restoration.** Assuming that 81% of European habitats are in poor status, planning goals should deliver to the target set by recently adopted proposal for Nature Restoration law and foresee that 20% of sea area is designated for restoration measures by 2030 and all ecosystems in need of restoration must be covered by 2050.

**Ecological carrying capacity.** An ecosystem-based approach considers the human community as an intrinsic part of the ecosystem, inevitably influencing its state and functioning. The goal of ecosystem-based approach in MSP is to maintain pressure within the carrying capacity limits of the ecosystem. The ecological carrying capacity limits describe the maximum of human activity that an ecosystem can sustain indefinitely. Within the capacity limit the ecosystem is able to maintain its diversity and functionality as well as to enhance its capacity to adapt to change and provide for the needs of future generations. For some species these limits are already exceeded as we see e.g. a progressing decline in harbour porpoises or poor environmental states of commercially targeted fish populations. If environmental trends or continuously poor ecological states of environmental goods are related to anthropogenic pressures (individual or cumulative, direct and indirect) the anthropogenic use is beyond the capacity limit. The ecosystem-based MSP should consider the ecological carrying capacity as the baseline of planning and strive to steer anthropogenic activities to a level at which the ecosystem components can reach good environmental status.

**Land-sea interaction.** Planning goals should reflect primary objectives of national social and economic policies safeguarding national interests in relation to human activities at sea and those which depend on marine ecosystem services and influence it. Important to acknowledge that the marine environment is not only affected by human activities at sea, but also by activities on land. It substantiates great importance of land-sea interaction as inseparable part of the planning process, and that the goal setting process should ensure a holistic view of relevant land-sea interactions and connect the marine policies with the ones for inland and (water)areas. In this context the EU Water Framework Directive contributes to the protection of territorial and marine waters and achieving respective objectives.

**The precautionary principle.** Baltic Sea broad-scale MSP principles consider the precautionary principle as a central part of maritime spatial planning. Importance of the application of this principle already at the goal setting stage is provided by high uncertainty of knowledge on true impact of current human activities at sea which are many and even higher uncertainty of knowledge on it changes in future. In line with the precautionary principle, planning goals should be set avoiding any human activities in areas where they can, individually or combined with other activities, threaten biodiversity or ecosystem services. This may include species-specific buffer zones.

**Climate change.** Climate change further raises the importance of the precautionary principle due to high uncertainty of existing knowledge of future effect of climate change on both ecosystem and human activities. However, planning goals should aim to strengthen the resilience to climate change but not increase vulnerability of the region. Considering climate change scenarios at the goal setting stage of the planning process enables introduction of respective mitigation and adaptation measures during the following stages when planning solutions are developed. The planning goals addressing climate change should account for the need to develop nature positive renewable energy and respective infrastructure, ecosystem services related to carbon storage as well as the need of climate refuge areas and coastal protection.

**Comprehensive knowledge.** The best available knowledge is one of the pillars supporting ecosystem-based maritime spatial planning. This cornerstone MSP principle runs through various components of the EBA framework. This knowledge should be fully applied in the development of planning solutions



and evaluating their effect on marine ecosystems. However, already at the goal setting stage knowledge generated under various policy is to be synthesized. Comprehensive spatial data showing nature values, marine green infrastructure, ecosystem services should be synthesized with knowledge on land-sea interactions land-based pressures provided by the WFD as well as with data on social and economic values. Such comprehensive analysis leads to identification of gaps and setting specific goals to improve the knowledge base.

**Policy impact analysis.** It is recommended to undertake a comprehensive evaluation that encompasses the analysis of policy goals to recognize potential interactions between varied interests. This analysis should extend to the identification of both existing and potential problems and issues that may hinder the achievement of the set goals. Moreover, it is crucial to assess existing and prospective threats that could compromise the realization of these objectives. Equally important is the recognition of potential knowledge gaps in relation to the established goals, as understanding these deficiencies is vital for informed decision-making and strategic planning.

**Adaptive planning.** Planning goals should be set assuming that adaptive management is inbuilt into the planning architecture. It implies that at later planning stages their adjustment is to be possible as a result of strategic environmental assessment of planning solutions. Adaptive management also involves recurrent evaluation and revision of plans which scope is to be set at the earliest planning stages. The role of adaptive planning drastically grows in the light of climate change to make the MSP process capable of adapting to changing climate parameters and to consider changes of pressures and ecosystem responses caused by climate change.

It is essential to clarify the feasibility of preliminary planning options and assess their capacity to integrate various goals, ensuring that they align with the overarching objectives of adaptive planning. Additionally, the preparation of future scenarios is vital for the planning process, allowing for the anticipation of changes and ensuring the continued achievement of set goals amidst evolving environmental conditions. Moreover, a periodic review of planning goals, in the light of their impact on marine ecosystems and the sustainable utilization of ecosystem services, is essential.

**Transparency.** Maritime spatial planning is a participatory process. It requires that all relevant authorities and stakeholders as well as a wider public are to be involved in the planning process from an early planning stage. Authorities and stakeholders in the consideration and communication procedures are identified by national legislation or can be identified in a specific roadmap for the planning process. Being involved in the goal setting process, authorities and other stakeholders bring their sectorial goals into the consideration of respective working groups. Sector specific visions should be formulated at the initial stage of planning to identify and account for sectoral policy goals. A Public Participation Strategy is one of the possible tools to outline communication principles and activities as well as to enlist stakeholder groups to be involved. It is essential to clarify the objectives of authorities and NGOs, focusing on promoting marine ecosystem conservation, biodiversity, and the sustainable management of ecosystem services.

## 8.2 Defining plan's content

The scope and specific objectives of the maritime spatial plan are largely defined by planning goals set at the goal setting stage of the planning process. During the planning stage, where the plan's content is defined, these goals are identified as potential spatial claims which are evaluated in relation to each other. Available knowledge is a basis for this process as well as feedback from evaluation and assessment of the plans potential content as part of the anticipated plan's impact assessment (e.g.



strategic environmental assessment). Solutions proposed in the first draft of the plan should be revised considering the assessment results, which might require several iterations of the planning procedure.

This stage includes compilation of extensive data on the marine environment components and their state, human activities, pressures and impacts originating from human activities both at sea and on land. Planning scenarios and solutions, including alternative solutions are developed at this stage utilizing the best available knowledge and following the precautionary principle to prevent any activities causing harmful effect on the marine environment. Practical recommendations compiled in this section is a collection of good practices to apply ecosystem-based approach in MSP originating from national plans in the North and Baltic Sea regions. They intended to provide guidance on how five key EBA elements are to be reflected in maritime spatial plans.

**Ecosystem integrity** in MSP process is the basis of ecosystem approach. It requires extensive data providing strong scientific evidence for planning solutions ensuring achievement nature conservation and restoration goals as well as healthy functioning of the ecosystem and human pressures within the ecosystem's carrying capacity limits.

Plan's content considers environmental targets set under EU Biodiversity Strategy 2030, thus in case that the existing MPA network within planning area does not meet the requirements, all compiled knowledge on ecologically significant marine underwater areas and other areas with significant natural values is to be utilized to identify areas with high potential for the use for nature conservation purposes.

The Baltic Sea Action Plan 2030 recognizes the significant role which MSP can play in the protection of the marine environment. It commits that plan's content signals areas of high nature value (Action HT13) and steer human activities away from areas where they can cause serious damage or disturbance (Action HT14). Green maps or green infrastructure can be utilized to signal the areas and steer human activities.

Due to limited knowledge and data on ecologically significant underwater areas and areas of significant underwater natural values the precautionary principle is to be applied in planning to ensure that no marine activities that threaten ecological integrity are placed in those areas. The importance of the precautionary principle increases due to uncertainties in the assessments of the state of the marine environment caused by climate change and limited knowledge on future development of human activities and related pressures.

Establishing dynamic natural areas in space and time can be considered to respond to the interaction between conservation objectives and possible shared use. For instance, areas can be closed for human disturbance for a certain time of the year prioritizing nature conservation functions for periods of breeding, spawning, resting and foraging of mobile species such as fish, birds and marine mammals.

A passive or active restoration of degraded or lost natural habitats (e.g. eelgrass meadows) can be considered as it has added value as ecosystem services which have been lost or diminished. Acknowledging that returning to conditions without human impact in most cases is not feasible, restoration measures may co-exist with other human activities if their compatibility is scientifically proved. However, the plan's content should delineate areas to allow for the natural evolution of existing processes. In addition to their conservation value, such natural areas are also of high importance for scientific research and as reference areas for estimating the impact of human activities at sea.



Areas for scientific monitoring of the natural evolution of existing processes are of vital importance and should be delineated where feasible. Natural areas, in addition to their conservation value, are also important for scientific research and as reference areas for estimating the impact of human activities at sea.

Addressing good environmental status of marine waters when defining plan's content assumes the level of cumulative or individual pressures which do not compromise healthy functioning of the marine ecosystem and that the ecosystem remains infinitely in good status. In addition to indicators and thresholds set under MSFD, regional specific thresholds for individual pressures developed by expert community utilizing the best available scientific knowledge should be considered. Presence of sensitive and endangered species, biotopes and habitats requires close consideration in the development of planning solutions, using specific guidance where available, such as the *Guidelines for Cetacean-sensitive MSP for the ASCOBANS Area*. Cumulative pressures and respective cumulative effects should be computed in transboundary context and account for land-sea interaction.

Zonation/spatial analysis can be applied to identify potential location of prioritized human activity (e.g. offshore wind farm) comparing cumulative pressure in different areas and accounting for biodiversity, restrictions, social impact, economic feasibility and other parameters. Mitigation measures are to be foreseen to minimize impact and ensure that cumulative pressure is kept to the level of the ecosystem capacity limits.

Zonation is a freely available decision support software for ecologically based land use planning including applications in spatial conservation planning and ecological impact avoidance. It is capable of data-rich, large-scale, high resolution spatial conservation prioritization. Zonation operates on spatial data about biodiversity features (species, habitats, ecosystem services), costs and threats. It can also utilize information about uncertainty and ecological factors such as connectivity. It is a major property of Zonation that it can maintain the many dimensions of biodiversity through prioritization. Zonation implements a broad set of methods and analyses in one package, allowing versatile use for solving many different types of problems.

[https://www.syke.fi/en-](https://www.syke.fi/en-US/Research__development/Nature/Specialist_work/Zonation_in_Finland)

[US/Research\\_\\_development/Nature/Specialist\\_work/Zonation\\_in\\_Finland](https://www.syke.fi/en-US/Research__development/Nature/Specialist_work/Zonation_in_Finland)

**Social, cultural and economic considerations.** Planning solutions have to be analysed from social, cultural and economic perspectives and balanced with environmental and nature conservation targets. Collaboration with stakeholders as a part of the planning process helps to weigh various political views on the plan's content. A conflict and synergy matrix could be an efficient tool to display the positive, neutral and negative interactions between interests.

Creation and maintaining of a comprehensive maritime information system containing the latest data on the state of the marine ecosystem and sea uses (economic activities of maritime sectors) is a tool facilitating compilation of the plan's content and it's reviewing, ensuring effective and timely data exchange between all involved parties. Socio-economic studies providing quantitative assessments of ecosystem services including marine ecosystem accounting should be supported. Establishing of a permanent platform (e.g. virtual portal) for regular communication, discussion with relevant stakeholders is recommended to facilitate communication.

Ecosystem services have to be mapped and assessed when compiling the plan's content. Mapping and assessment of ecosystem services (MAES) is preferably to be based on the Common International



Classification of Ecosystem Services (CICES) however, other classification can be considered.<sup>3</sup> The identification and assessment are to be based on the best available data and expert knowledge on ecosystem components and biophysical mapping of the ecosystem's potential to deliver services. Social and economic values of the services are to be assessed wherever knowledge and resources are available. Potential production areas of ecosystem services can be integrated in the plan as 'significant underwater nature values'.

Mitigation measures can be included in the plan's content or proposed for implementation at project level as to avoid, minimize, restore and offset negative impacts on the marine environment. The need to foresee mitigation measure can be justified by SEA and considered when building plan's content. However, avoiding impacts is to be regarded as an ultimate solution. Practical measures to mitigate the environmental impact of maritime spatial plans should be tailored for and targeted on the areas with high risk that pressure might cause significant environmental effects. Planning of mitigation measures should consider, among other things, the marine and water protection objectives that are typical of the areas, cultural values, open seascape, landscape values, development needs for tourism and recreational use, securing the operating conditions of maritime transport, and international infrastructure and transport connections. All these aspects should be reflected in the environmental report developed at the early stages of the plan's content defining.

**Comprehensiveness and coherence.** The best available comprehensive scientific knowledge is one of the pillars supporting ecosystem-based maritime spatial planning. It's considered in a dedicated section of this document. Thoroughly, compiled knowledge synthesised in cartographic material called "marine green infrastructure" (Green Map) is to be fully utilized to define plan's content. Generated spatial data should be utilized to produce maps demonstrating aggregated nature values and sensitivity of species, biotopes and habitats. The same concerns human activities and respective individual and cumulative pressures which should be considered in transboundary and cross-sectorial context accounting for land-sea interaction.

Gap analysis performed in line with defining plan's content is intended to identify needs for additional scientific evidence and justify planning solutions. These gaps can be bridged through targeted studies launched to obtain missing data to underpin the maritime spatial plans and allow for specific activities at sea to take place.

Land-sea interaction is an important component of the plan's content comprehensiveness. Pressures originating from land-based sources constitute a significant part of cumulative pressure on marine environment and though, they lay beyond the MSP scope, they should be accounted for the assessment in cumulative pressure. Among the most significant pressures primarily originating from land-based sources are input of substances and input of energy. These pressures are to be specified for each marine area or sea basin. Coastal protection and development of coastal infrastructure as well as recreational activities in coastal areas are the human activities significantly contributing to the pattern of pressures on the marine environment. In combination with the high ecological value of coastal biotopes, human activities related to the interaction between land and sea and related pressures are to be thoroughly considered in maritime spatial planning process.

**Integrated governance.** All authorities responsible for the implementation of sectoral policies should be involved in the reviewing of the plan's content. Their main task is to evaluate whether the allocated space is sufficient to meet sectoral targets. Practically, establishing a working group consisting of representatives of respective public authorities may serve for the purpose. In case the working group

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<sup>3</sup> See the Finnish example of mapping valuable marine areas for ecosystem services; [link](#).



grows large a steering group consisting of key implementers can be set up to coordinate the reviewing process. Key planning decisions are made by the steering group including practical aspects of the implementation of an ecosystem-based approach. The sectoral authorities included in the working group maintain a dialogue with sectoral businesses and organizations ensuring that MSP process is considerate of developments and needs within the sectors, as well as allowing for national sectoral targets to be met. The working group and steering group thus ensure the coordination and integration of targets, plans and legislation, which the MSP needs to conform with.

International policy agreements such as Regional Sea Conventions serve to coordinate the effort to protect marine environment and ensure progress towards good environmental status of marine waters. They also provide (or could provide) a platform for cross-border consultations to ensure coherence of national maritime spatial plans across respective sea basins. International agreements also identify environmental goals, specific thresholds for good environmental status and sets of indicators demonstrating the state of marine environment at sea or basin level. This information should be considered when identifying plan's content to ensure that cumulative pressure remains within the ecosystem capacity limits and the plan contributes to overall effort towards achieving good environmental status of marine waters.

Formal cross-border consultation rounds are to be arranged to ensure transboundary coherence of plan's content. Guidelines for transboundary consultation can be developed under the umbrella of respective regional working groups (e.g. HELCOM-VASAB Guidelines on transboundary consultations, public participation and co-operation). Bilateral or trilateral meetings between neighbouring countries addressing specific environmental impacts of MSP as well as cumulative impacts in the neighbouring areas is useful instrument for the development of related plan's content ensuring MSPs cross-border coherence.

Practical recommendations ensuring transparency of the plan's content include the development of a roadmap for MSP process which among other issues outlines relevant stakeholders' groups and sets a communication plan. Sectorial visions can be developed to outline sectorial goals and identify respective content of the plans. National coordination in the form of cross-sectorial working groups or coordination committees may provide a platform for stakeholder's dialog. Establishing of an online platform facilitates such cross-sectorial communication. However, formal consultation procedures are an essential part of the plan's content development. They might include several iterations considering results of impact assessment in the frame of MSP process and also ESPOO-consultation.

**Adaptive management.** The Malawi principles declare that ecosystem-based management must recognize inevitability of changes. It concerns changes of the state of ecosystem, including climate change, changes of societal and economic demands as well as continuously growing scientific evidence base. Accounting for these changes in consequent cycles of continuous MSP process with respective adjustment of planning solution to address emerging challenges is considered as adaptive management. To identify the plan's content and develop planning options, scenarios for the future of the maritime area under consideration are to be developed. Scenarios can be based on the best available knowledge on current conditions and at the same time consider the results of monitoring and evaluation. The scenarios can be utilized for selection of the most suitable planning solution, but they can also be used to increase preparedness for quick reaction on changing conditions. The scenarios consider changes in planned maritime areas' operating environment in a long-term perspective. Ecosystem and climate change indicators in combination with economic perspective and views of different societal groups are to be used to assess the impacts of the scenarios.



The German MSP (2021) included three scenarios (planning options) which have been considered at an early conceptional stage and were included during the first consultation phase. They represented focus on first, traditional maritime uses, with a special emphasis on shipping, extraction of resources and fishery, second, a prioritization of climate protection and mitigation and third, the extensive protection of marine areas for marine nature conservation. Each scenario was designed to show planning options, illustrating conflicts and competition between the sectors. The aim was to increase the transparency of the planning process and the understanding of the underlying processes to balance sectoral interests. The scenarios did not reflect the sectors' maximum requirements but were developed as plausible options. Nevertheless, the intention was rather to initiate a dialogue with stakeholders than to select one of the options. The dialogue with and between the sectors led to beneficial statements in the consultation phase, shaping the later MSP drafts.

Establishing dynamic in space and time nature conservation regimes for sensitive areas not only MPAs) could be considered to optimize the response to the interaction between conservation objectives and possible shared use. For instance, restrictions for certain human activities might be imposed on certain areas to minimize human disturbance in periods of breeding, spawning, resting and foraging of mobile species such as fish, birds and marine mammals. Guidelines for how to include such measures in MSP can be found e.g. in *Guidelines for Cetacean-sensitive Maritime Spatial Planning for the ASCOBANS Area*. Additionally, changes of boundaries for nature conservation areas or areas with priority human activities could be foreseen for various scenarios.

The challenge of lacking knowledge or data on the space required for specific human activities to ensure the achievement of respective targets (e.g. renewable energy) an excessive area can be designated with subsequent specification of the requirements in the cause of the development of particular project. In case, when the implementation of the plan demonstrates that an activity has insufficient space to meet national targets, the plan can be adaptable through e.g. an addendum or partial revision of the plan, which in its turn should be a subject for strategic environmental assessment.

Reasonable alternative planning solutions can be considered in the plan's content to avoid or reduce negative environmental and other impacts as well as impacts on the ecosystem services. Alternative planning strives to compare proposed solutions, including current status and "zero" alternative and demonstrate the impact of the plan. The impact assessment shows the difference in impacts of applying the maritime spatial plans and not applying them. Practically, specific national assessment tools can be applied for the analysis of interacting between different human activities and their cumulative environmental effects (e.g. Symphony tool in Sweden). The alternative planning solutions should be also analysed from societal perspectives, in the context of the good environmental status of marine waters.

Climate-smart MSP addresses climate neutrality and adaptation to climate change. Various aspects of climate-smart MSP are thoroughly considered in dedicated section of this document. In relation to adaptive management, it means strengthening of the MSP process ability to adapt to changing climate parameters and to address changes of pressures and respective ecosystem responses caused by climate change. The precautionary principle as one of the fundamental MSP principles is to be applied assuming uncertainty of knowledge on the climate change consequences for ecosystem and human activities.



### 8.3 MSP's impact assessment

The assessment of plan's impact and evaluation of its outcomes shall provide insights that can strengthen EBA in MSP. A common practice by public authorities of EU Member States, including MSP authorities, is to implement the Strategic Environmental Assessment (SEA), which is a legally established process to ensure high-level environmental protection by integrating environmental considerations into the preparation, adoption, and implementation of plans.

Internationally, the environmental assessment mechanism was introduced by the United Nations Economic Commission for Europe Convention on Environmental Impact Assessment in a Transboundary Context on 25 February 1991 (known as the Espoo Convention) to assess the environmental impact of certain activities at an early stage of planning. From its establishment, the Convention has encouraged the parties to apply its principles to plans and programmes as well. In 2003, in Kiev, a Protocol on Strategic Environmental Assessment to the Convention<sup>4</sup> was signed to identify and prevent possible environmental impacts right from the start in decision-making, and to ensure that environmental considerations are integrated, thus enabling environmental objectives to be considered on par with socio-economic ones.

For EU Member States, the procedure for carrying out SEA is laid down by the EU SEA Directive 2001/42/EC<sup>5</sup> and contains the following main steps: scoping, preparation of the environmental report taking into consideration baseline information and reasonable alternatives, public consultation including transboundary consultation, decision-making, and monitoring.

The MSP Directive 2014/89/EU Recital 23 states: "Where maritime spatial plans are likely to have significant effects on the environment, they are subject to Directive 2001/42/EC. Where maritime spatial plans include Natura 2000 sites, such an environmental assessment can be combined with the requirements of Article 6 of Directive 92/43/EEC, to avoid duplication."

Article 6(3) of Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora also requires that any plan likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. This article is also referred to in the SEA Directive, Article 3(2)(b).

A similar procedure to SEA (for plans and programmes) is established for assessing a single project's impacts on the environment, known as the Environmental Impact Assessment (EIA). Internationally, it is regulated by the Espoo Convention, and for EU Member States, it is also governed by Directive 2011/92/EU, as amended by Directive 2014/52/EU<sup>6</sup>. Maritime spatial plans can designate areas for major blue economy projects such as offshore wind parks, marine aquaculture, and grid infrastructure. In practice, this legal instrument is often cited in the plans as a mitigation measure during the implementation of the adopted maritime spatial plans.

EU Nature Restoration Regulation (NRR) is in force since 18 August 2024 setting new tasks to be integrating into MSP and having relevance for impact assessments.

The above-mentioned legal frameworks interpret "impact" from a broader and holistic perspective. An impact means any effect caused by a proposed human activity on the environment, including

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<sup>4</sup> <https://unece.org/text-protocol>

<sup>5</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32001L0042>

<sup>6</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02011L0092-20140515>



human health and safety, flora, fauna, soil, air, water, climate, landscape, historical monuments or other physical structures, or the interaction among these factors. It also includes effects on cultural heritage or socio-economic conditions resulting from alterations to those factors.

### **Ecosystem integrity**

The development of a Maritime Spatial Plan represents an opportunity to establish a benchmark for past trends and the current state of the marine environment in a spatially explicit manner. MSP requires spatially explicit data (e.g., abundance, distribution patterns, habitats, animal migration routes) on nature values with rather fine resolution. This necessitates significant efforts in collecting data, information, and knowledge for evaluating impacts, which are essential for implementing the EBA approach in MSP and for use in SEA. The consistency of information used by the planning and assessment teams is crucial for ensuring qualitative decision-making.

The guideline's section on data and knowledge recommends the nature and environmental data sets to be used in MSP. Data on different marine ecosystem components and environmental characteristics are also crucial for assessing the current state of the environment and its likely evolution without plan implementation. For assessing likely evolution, information on past trends in pressures (e.g., pollution loads or other disturbances) should be considered. Specific guidelines for MSP for certain environmental components should also be consulted where applicable, for example the *ASCOBANS Guidelines for Cetacean-sensitive Maritime Spatial Planning*.

MSFD primarily provides a baseline assessment of the state of the marine environment based on descriptors, some of which include thresholds for identification of good environmental status. Challenges to include MSFD assessments in MSP is due to broad spatial resolution of the assessments (sub-basin, basin or the Baltic Sea as a whole) as well as all thresholds are not yet agreed, for the moment. Nevertheless, the linkage between MSFD assessment criteria and MSP is essential to be considered in the impact assessment.

Nature and environmental data are most often collected by national inventories and regular national monitoring programmes. Nevertheless, specific data analyses (e.g., on fish or bird species) or studies on challenging issues can be conducted to cover gaps in regular monitoring data. It is also important to collate existing Baltic-wide nature and environmental assessments to ensure a holistic and cohesive assessment process. Using transboundary datasets (e.g., those available at HELCOM) for certain mobile species is highly important for performing comprehensive assessments. Inquiring missing or complementary data and expertise from neighbouring countries supports reliability and credibility of the assessment.

Mitigation measures are strategies and actions implemented to prevent, reduce or eliminate negative impacts on the environment, society, and economy. Impact assessment shall propose diverse mitigation measures including technological innovations such as nature-based solutions/nature inclusive designs, policy changes, regulatory frameworks, community initiatives supporting sustainable use of marine space. Mitigation measures should also cater for restoring damaged habitats, marine areas or individual species. The mitigation measures are those which can be explicitly presented in relation to specific MSP development zones or intended projects. During the licensing or permitting process, these conditions for sea use and the associated mitigation measures should be considered.



### **Social, cultural and economic considerations**

Several approaches and tools can be employed for a comprehensive assessment that includes all values. Mapping and assessing ecosystem services, including ecosystem accounting, can deliver information on the contributions of ecosystems and their components to human well-being. An ecosystem service framework has been developed over the past decades to show how people benefit directly or indirectly from natural processes or the use of ecosystems, including marine and coastal ecosystems.

The Baltic Sea ecosystem and its components provide a range of goods, such as wild fish and algae for food or feed, regulation and maintenance of the ecosystem through processes like carbon sequestration or nutrient treatment, and non-material gains from recreational interactions with the ecosystem. The benefits provided by ecosystems can be accounted for in terms of employment, income, availability of raw materials for industry, health, and various other contributions to personal well-being. Assessing cultural ecosystem services is one way to consider the non-tangible benefits provided by the sea. Most commonly, recreational activities that are linked to multiple benefits are addressed either from potential uses or preferences of beneficiaries.

A Common International Classification of Ecosystem Services (CICES)<sup>7</sup> has been established to ensure international comparability and coordination of assessment approaches and outcomes. Ecosystem services are classified, including coding, according to three main groups: provisioning, regulating, and cultural ecosystem services. Relevant indicators are proposed for operationalizing the CICES. The assessment of ecosystem services is to be based on available data combined with expert knowledge.

Ecosystem accounting is a statistical framework for organizing and assessing ecosystem data, primarily from an economic perspective, similar to traditional economic or national accounts, which are assessed annually by statistical offices. Ecosystem accounting is linked to the concept of natural capital and operates with indicators in both biophysical and monetary units, assessing stocks and flows of ecosystem components, also referred to as assets, such as fish or algae. Methodological guidance on ecosystem accounting is provided by the UN Statistical Commission.<sup>8</sup>

The capacity to deliver ecosystem services and thus benefits depend on the condition, including the state, of the ecosystem. Achieving good environmental status results in higher flows of ecosystem services, leading to greater gains for human well-being. The MSP, as a tool for coordinating and assessing impact, can spatially identify and highlight the need to improve ecosystem condition and thus the capacity to deliver ecosystem services.

**“A sustainability assessment”** covering all three dimensions of sustainable development is another approach to consider multiple aspects in an integrative way. It should also help demonstrate that the plan is the most appropriate, given the reasonable alternatives. A sustainability assessment applies a holistic assessment of the likely effects of the planning document by scrutinizing its potential impacts on economic, social, and environmental outcomes.

In the context of MSP, outcomes from ecosystem services assessments or sustainability appraisals can support planners and decision-makers in trade-off analyses of different scenarios and alternatives, producing the best spatial solutions considering all kinds of values. These assessments can propose management actions, including the needs for nature conservation. A trade-off analysis can be supported by the production of a synergy and conflict matrix to display interactions between development interests and considerations.

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<sup>7</sup> <https://cices.eu/applications-of-cices/>

<sup>8</sup> <https://seea.un.org/ecosystem-accounting>



When assessing impacts and evaluating different alternatives, it is important to recognize the uncertainty of anticipated economic sectoral developments and their potential environmental implications within MSP.

HELCOM thematic assessment of economic and social analyses<sup>9</sup> provides an approach how to assess the socio-economic benefits, which data including indicators and metrics could be applied for socio-economic analysis. Yet the major drawback is that a part majority of the analysis and assessments are not spatially explicit but present values at national or regional scales.

### **Comprehensiveness and coherence**

Scoping of the assessment is one of the first steps in the impact assessment process. This phase involves defining the boundaries and objectives of the assessment, determining the specific topics and issues that need to be addressed. It also involves identifying the data and information that will be used in the assessment, leveraging existing data and knowledge to build a foundation for analysis. The use of harmonized data also increases the coherence of spatial plans across sea basins. Additionally, this step is crucial for pinpointing any gaps in the available data or knowledge, which may require further research or data collection to ensure a comprehensive and thorough evaluation. By carefully scoping the assessment, stakeholders can ensure that all relevant aspects are considered, facilitating a more accurate and effective impact assessment.

Establishing criteria, indicators, and metrics to be used for evaluation is a critical step in the assessment process. The developed indicators can be applicable for the assessment of the plan's impact on the progress towards the set political objective, which can in its turn be helpful for assessing implementation of MSP. The development of the indicators might involve also defining threshold values (e.g. in relation to good environmental status) that will be used to measure and evaluate the impacts under consideration. For example, criteria might include single pressures such as pollution or habitat loss, as well as cumulative pressures that consider the combined effects of multiple factors. It is important to assess both short-term and long-term effects to understand immediate impacts and potential future consequences. Additionally, linking the condition of ecosystems with their capacity to deliver ecosystem services is essential. This means evaluating how changes in ecosystem health affect their ability to provide benefits for human well-being.

An analysis of coherence and comprehensiveness of all policy goals and targets including achieving good environmental status and other targets highlights consistency, contradictions, or conflicts among the policies.

Elaborating on scenarios or alternatives for the proposed spatial solutions to be evaluated according to defined criteria and indicators is a key step in the impact assessment process. This involves developing a range of potential scenarios or alternatives, each of them encompassing various potential outcomes and impacts. By comparing these scenarios or alternatives against the previously established comprehensive criteria, indicators and metrics, stakeholders can understand the trade-offs and potential consequences of each option.

Coherence is cross-border consideration in MSP. Cross-border coherence, including coherence within sea basin, involves collaboration and coordination between neighbouring countries or regions starting from early stage of planning throughout the impact assessment and evaluation. HELCOM-VASAB MSP

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<sup>9</sup> <https://helcom.fi/wp-content/uploads/2023/03/HELCOM-Thematic-assessment-of-economic-and-social-analyses-2016-2021.pdf>



working group has developed a voluntary guidance on assessment of cross border coherence.<sup>10</sup> This guidance highlights that one needs to pay attention to features such as ecologically important areas, ranges of species as ecosystem boundaries do not follow administrative boundaries.

Land-sea interaction is an important aspect in EBA in MSP. Many pressures originating from land-based sources constitute a significant part of cumulative pressure on marine environment and environmental impact, and though they lay beyond the MSP powers they should be accounted for the assessment in cumulative pressure. Input of nutrients and hazardous substances, coastal protection and development of coastal infrastructure as well as recreational activities in coastal areas are human activities significantly contributing to the pattern of pressures on the marine environment. MSP might be utilized as a tool to communicate policy messages addressing land-based sources of pressures to the external responsible bodies.

### **Integrative governance**

Stakeholders and public participation from the early stages and throughout the planning and impact assessment process is crucial for fostering inclusive, informed, and transparent decision-making. By engaging with key stakeholders and NGOs from the outset, the process benefits from diverse perspectives and local knowledge, enhancing the quality of the assessment and ensuring that a wide range of concerns and values are considered. Early and ongoing engagement helps identify potential issues and opportunities proactively, facilitating more effective mitigation strategies and innovative solutions.

Starting impact assessment at an early stage allows for the synchronization of data collection to meet the needs of both MSP and SEA process. This integrated approach ensures that MSP and SEA are based on consistent and up-to-date information, leading to more coherent and effective planning of solutions.

Developing decision-support tools for impact assessment and evaluation is essential for enhancing the effectiveness and efficiency of the assessment process, particularly to assess cumulative environmental effects. These tools usually integrate diverse spatial datasets, employ advanced modelling and simulation techniques, apply multi-criteria decision analysis to evaluate alternatives comprehensively. They also facilitate stakeholder engagement through user-friendly interfaces, enable scenario analysis to explore various outcomes. A number of tools have been developed in the Baltic Sea region to support MSP (e.g. PlanWise4Blue, Symphony, BASMATI).

### **Adaptive management**

The developed scenarios serve dual purposes by supporting both the planning and implementation processes, particularly when challenges arise. These scenarios offer plausible pathways to anticipate and evaluate future challenges, providing a structured approach to understanding potential obstacles.

Impact assessment relies heavily on monitoring data that is regularly collected or from new studies conducted. To strengthen impact assessment, it is crucial to leverage all available data from projects and research. Given that the planning process often spans a significant period, it is essential to utilize up-to-date information for accurate impact assessment and evaluation. This iterative assessment process can be effectively supported by digital decision support tools and by actively engaging stakeholders. By integrating these approaches, decision-makers can maintain responsiveness to evolving conditions, enhance the reliability of assessments, and foster inclusive decision-making that

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<sup>10</sup> <https://helcom.fi/wp-content/uploads/2022/02/Voluntary-guidance-for-assessment-of-cross-border-coherence-in-MSP-.pdf>



aligns with current knowledge and stakeholder perspectives.

The precautionary principle underscores the importance of acknowledging the constraints of current knowledge, alongside utilizing it effectively. Planners are highly recommended to weigh uncertainties surrounding the actual impacts of human activities and opt for cautious decisions in high uncertainty scenarios. Given the uncertainties linked to changing climate conditions, adopting a precautionary approach becomes increasingly critical.

## 8.4 Monitoring and evaluation

All Baltic Sea countries which are EU Member States have developed and some of them even revised the first edition of national maritime spatial plans. Acknowledging that, the Regional Baltic Sea MSP Roadmap 2030 identified building a sound basis for an adaptive maritime spatial planning process applying the ecosystem-based approach as the key priority. In this context monitoring and evaluation (M&E) of MSPs implementation and impact is necessary and fundamental step for continuous improvement and adaptation to the state of knowledge and further development of a guiding framework for MSP, which is regarded by the Roadmap as the first objective.

In MSP context, monitoring is understood as systematic collection of data and information during the lifespan of the marine spatial plan and during the drafting process. And evaluation is a periodic activity that establishes whether the objectives of the plan (or progress towards the objectives) have been achieved. The complexity of MSP's goals and objectives as well as diversity of required information and means for its obtaining identify the complexity of M&E which is often even less tangible and comprehensible in relation to ecosystem-based approach. But "Monitoring, review and evaluation are linked to a key principle of EBA: adaptive management. This principle involves both continuous learning and improvement [...]" (European Commission 2021).<sup>11</sup> Organization of MSP M&E process is also a requirement of SEA directive. This section is intended to provide guidance for monitoring and evaluation of EBA in MSP based on its five key elements.

Since M&E creates the basis for the plans reviewing and revision ensuring sustainable development at local, national, and regional levels, monitoring programme should be developed as an integral part of the maritime spatial plan. It should identify the scope and sources of information and observation means and processes which supply it. The programme should also consider all related goals and identify methodologies for the evaluation of their achievement. The programme should also consider timeline for the reviewing of key related policies. The following general recommendations can be given for the development of M&E programmes:

- M&E should include assessment of MSPs contribution to the increase of climate change resilience, including the effect of adaptation and mitigation measures.
- M&E should consider the impact of planning solutions in transboundary context assessing MSPs coherence across the sea basin.
- M&E should involve broad spectrum of relevant stakeholders to ensure comprehensiveness and reliability of the used information.
- M&E results should be effectively integrated in the MSP process and considered in the plans reviewing and revision.

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<sup>11</sup> European Commission (2021). Guidelines for implementing an Ecosystem-based Approach in Maritime Spatial Planning. Including a method for the evaluation, monitoring and review of EBA in MSP. doi: 10.2926/84261



- M&E results and respective changes of planning solution should be communicated with relevant stakeholders to ensure sustainability of the proposed changes, avoiding potential conflicts between sea users.

Monitoring and evaluation of the EBA application cannot be considered separately from the overall M&E. However, the concept of M&E should specify the frame for monitoring and evaluation of EBA addressing its five key elements and integrating clear structure and procedure. To avoid ambiguity or double work it is recommended to:

- a) Define the EBA concept for the corresponding MSP,
- b) Analyse which aspects are already covered by the MSP M&E concept,
- c) If necessary, fill the gaps with an EBA M&E,
- d) Summarize the results explicitly for EBA in the MSP M&E reporting.

### Conceptual M&E framework

The M&E approach is based on the concept of covering all aspects of MSP and reducing the complexity by subdividing the issues into manageable dimensions. Every aspect within the MSP system can be an object of change and therefore has to be evaluated if the MSP needs adaptation. The following dimensions are relevant for monitoring and evaluating of the plan and its implementation:

- The state of the sea – the state of the marine environment, nature conservation and restoration and provision of ecosystem services;
- Human activities in the sea – which sectors are using the sea in what way and with what future needs;
- MSP designations – how the plan is regulating the use of space (plan effectiveness);
- The planning process – the process of drawing up, implementing and revising an MSP plan and the involvement of stakeholders in this process;
- The regulatory frameworks for MSP and relevant policies;
- The coherence of the plan within the sea basin and with the neighbouring plans.

**The first dimension** is the sea itself, comprising the planning area (space) and the marine environment. Monitoring of the environmental status of marine ecosystems is legal obligation in all Baltic Sea countries, not least in the context of the MSFD. There are likely to be existing environmental monitoring programmes which are capable to provide comprehensive data. Environmental monitoring is highly relevant for MSP as changes in the environment can justify the need to revise planning solutions, not least with respect to conservation and restoration designations. Environmental monitoring is essential to determine whether environmental goals will be reached, or the plan leads to unexpected environmental impacts causing deterioration of the state of the marine ecosystem. Environmental monitoring is likely to gain more importance and urgency in the context of climate change affecting seas and coasts.

**The second dimension** is intended to evaluate human activities in the sea. Over time, there are likely to be changes in how each sector is using the sea. New activities and technologies may emerge, new opportunities might arise for co-use, or some activities may be discontinued. This dimension is closely linked to (changing) policy goals but is concerned with the actual or prospective use of the sea and how the sectors themselves envision this. This may also be affected by climate change and sectors may need to adapt to changing circumstances and policy goals. One example of a short-term change in how sectors are using the sea is the rapid expansion of offshore wind farming in response to the energy crisis and the need to mitigate climate change.



**The third dimension** is about the plan itself and the designations it contains. It is intended to demonstrate whether the implementation of the plan effectively leads towards the plan's objectives and whether they will be achieved. This dimension may also be called as monitoring and evaluating of plan's effectiveness.

**The fourth dimension** is the evaluation of the planning process including coordination of related activities, organization of collaboration between various authorities and stakeholders' involvement. It should also consider the improvement of the planning solutions in the course of iterative planning process accounting for SEA results, sectorial needs and other potential drivers. This dimension demonstrates integration of different management levels in the planning process, considering sectorial interests, and assesses the perceiving of the plan by various stakeholders' groups.

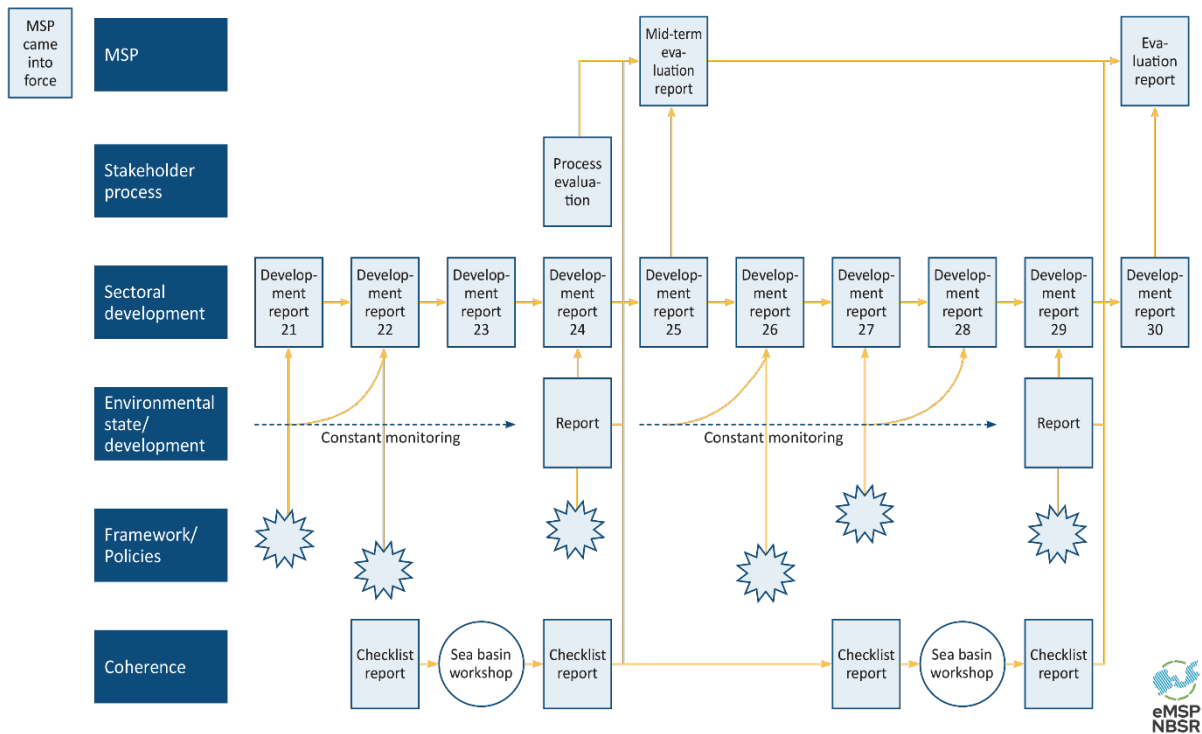
**The fifth dimension** keeps track of the policy and regulatory environment of MSP to evaluate the potential impact of legislative changes on the next round of MSP or justify needs for urgent adjustment of the current plans. A current case in point is the increasing strategic importance of offshore wind farms; another is the 30x30 targets set out in the 2022 Kunming-Montreal Global Biodiversity Framework and the European Biodiversity Strategy as well as the legal targets under the NRR. Ability to react timely and address emerging changes in the frame of maritime spatial planning is a key for adaptive management.

**The last but not least dimension** is monitoring and evaluation of the plans' coherence. Coherence is to be sought not only with neighbouring planning areas but also in the sea basin scale. Coherence is required by the MSP Directive, but it also makes practical sense from an environmental and functional point of view, such as ensuring the cross-border coherence of (linear) infrastructure. In accordance with one of the EBA key elements -comprehensiveness and coherence – is to be achieved and assessed through international cooperation and aligned with recent developments.

Generally speaking, the purpose of monitoring and evaluation is to identify whether there are changes in these dimensions. If the observed developments deviate from the scenario envisaged in the plan, a (partial) revision of a plan or other plan adaptation may become necessary even outside the regular time frame.

Information for the M&E process can be obtained from multiple sources. In general, the MSP or connected SEA do not require establishing of a new monitoring system relying primarily on existing sources of information. Among which above mentioned existing environmental monitoring programmes play significant role. Additionally, regular regional holistic assessments of the state of the marine environment, organized in the frame of regional sea Conventions, can be significant source of information, providing comprehensive view to the state of marine environment and its changes in the sea basin scale. It integrates also assessment of human activities at sea, their individual and cumulative pressures and cumulative impact. Sectorial information might be obtained from available national and EU statistical reports. However, the importance of including stakeholders or institutional bodies with sectoral responsibility with their specific knowledge cannot be overestimated.

The following figure 4 is intended to illustrate the interplay of six dimensions within the conceptual framework. At the illustration each dimension is considered separately, and each is related to a particular product. Potentially, all dimensions come together in an all-inclusive midterm evaluation report after 5 years and a final evaluation report after 10 years. However, the timeframe for M&E processes is to be established nationally considering existing policy scope and legal requirements. The same concerns M&E products. The conceptual framework therefore intends to encourage a more structured approach to designing M&E, not least to enable transparency and clarity to stakeholders on how the information was obtained.



**Figure 4.** Interplay of six M&E dimensions within the conceptual framework.

**Application of the conceptual M&E framework to evaluate EBA in MSP.**

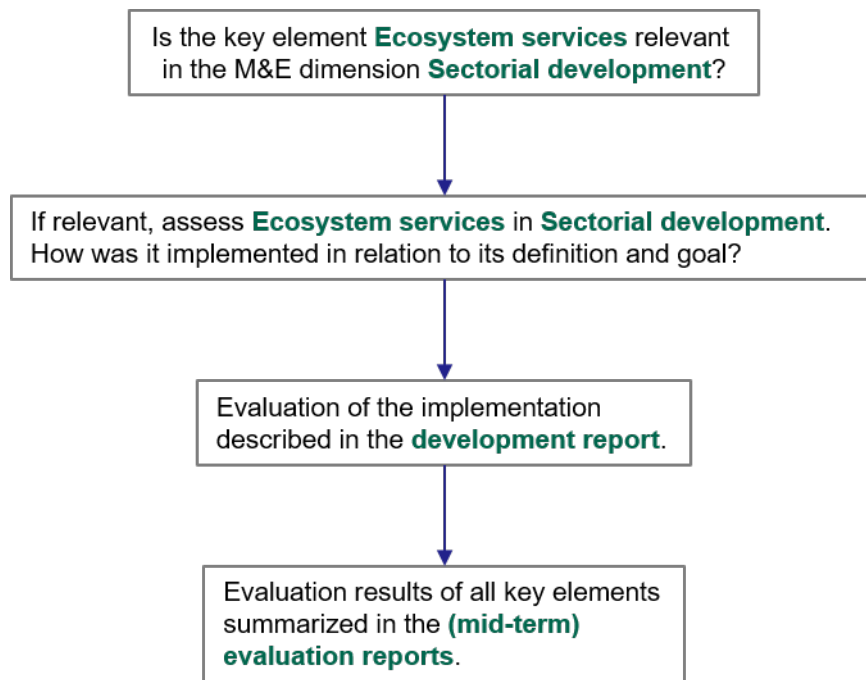
The conceptual M&E framework was developed for inclusive follow-up of MSPs. It can be utilized to assess the application of ecosystem-based approach in MSP as one of the fundamental principles guiding spatial planning in the sea. This requires relating 5 key elements of ecosystem-based approach in MSP, identified in section 5 of this Guideline, to M&E processes described by dimensions of the Conceptual framework.

This relation can be presented in format of a matrix where each M&E dimension provides indicative information on certain EBA element. Obviously, not all M&E processes are applicable to the assessment of all aspects of EBA. However, all together they provide a holistic assessment and might serve for identification of gaps and needed corrections. The following matrix demonstrates how key elements can be assessed through the M&E dimensions of the conceptual framework. Linked to the exemplary framework with timeline and concrete products, EBA key elements could be assessed within several parts – depending on the content. The following matrix can be used as a checklist and linked to the general M&E procedures to create an overview the application of EBA in the plan.

Applying the EBA should run through the entire plan and the planning process, which is why a separate EBA assessment is an artificial separation. Due to the complexity of assessing a comprehensive approach such as EBA-based MSP, a checklist-overview can be a feasible solution to summarise the evaluation. It might be recommendable to follow the product-based approach, as exemplified in the conceptual framework, using the checklist for going through each dimension. In the checklist, each box or link can be assessed separately, checking if and how the key EBA element was applied. Comparing this to set objectives, new available knowledge and further internal or external recommendations will give an impression of the state of each key element.



Assuming that the conceptual M&E framework is applied, a stepwise approach to identify relevance of EBA element for M&E dimension can be executed as exemplified by the scheme. Finally, the results could be added to the evaluation reports in a summarising chapter.



Dimensions of M&E						
EBA Key Elements	Plan effectiveness	Planning process and stakeholder participation	Sectorial development	Environmental impact	Changes of legal and policy framework	Plans coherence
Ecosystem integrity						
Biodiversity						
Restoration						
Ecosystem capacity limits						
Cumulative impacts						
Mitigation measures						
Social and economic considerations						



Humans as part of the ecosystem						
Ecosystem services						
Cultural elements						
Comprehensiveness and coherence						
Comprehensive knowledge						
Precautionary principle						
Land-sea interaction						
Integrative governance						
Coordination						
Subsidiarity						
Participation						
International cooperation						
Adaptive management						
Integrated approach						
Climate change						
Alternative development						
Monitoring & Evaluation						

Monitoring and evaluation provides information which is crucial for understanding of interaction of human activities and functionality of the marine ecosystem. This knowledge helps to develop better plans ensuring sustainable development of respective marine areas in long-term perspective as well as addressing emerging challenges. However, it is obvious that obtaining better and more specific information requires more resources. And thus, availability of the resources becomes a restrictive factor for M&E system. A balance between the quality of M&E results and available resources is to be sought. Considering these two factors, a customized national M&E concept can be developed pursuing national and regional policy priorities.



Moreover, M&E concept does not solely serve for gathering information for better planning (for planners). This is also a tool for sharing information, ensuring transparency of MSP process and helping to engage relevant stakeholders. Generally speaking, M&E provides two-way information flow channel after the adoption of spatial plan.

## 8.5 Participation and interaction

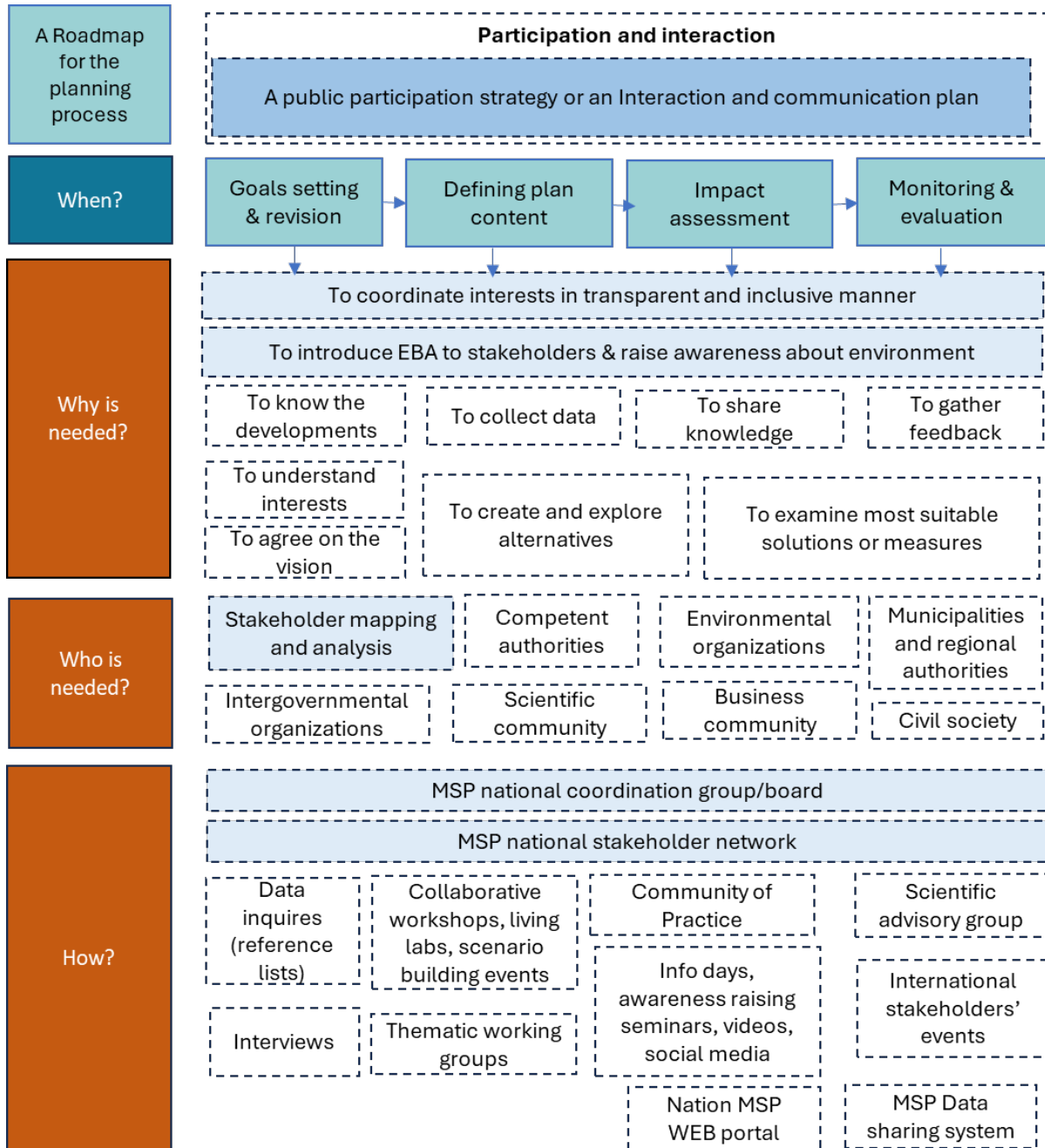
Maritime spatial planning is a participatory process. The quality of planning, political adoption and public acceptance of the plan is guaranteed by accounting for the demands of various stakeholder groups and resolving potential clashes of sea users' interests. Thus, participation should be considered as a two-way communication process ensuring proper cross-sectorial and multi-level interaction.

In many countries participation and interaction process in MSP is regulated by national legislation, which identifies authorities and institutions to be involved in the planning process. A framework for cross-border and public consultations is also provided by national or international legal (including EU Directives) and policy documents. [A Guidelines on transboundary consultations, public participation and co-operation](#) was adopted by HELCOM and VASAB in 2016, at a time when most BSR countries had little experience in MSP. However, these are merely the minimum requirements for complying with democratic principles, while planners recognize additional benefits from active and engaging public and specific stakeholder involvement.

Integrated governance is a key element of the ecosystem-based approach (EBA) in MSP, characterized by coordination, subsidiarity, participation, and international cooperation. This chapter on participation and interaction addresses **participation** within a broader context, encompassing other related features to some extent.

This section aims to provide practical guidance on key considerations for organizing participation and interaction throughout the planning process, aligned with the concept of an ecosystem-based approach. Participation and interaction should continue **throughout the entire planning process** (different planning stages) starting from goal setting and plans' content compilation, continuing at the impact assessment stage, and monitoring and evaluating the plan's implementation and developing revision if needed. (see scheme below).

The intensity and focus of the participation depend on specific needs of MSP and context, e.g. challenges to be addressed. To ensure an effective yet inclusive and transparent process, participation and interaction activities should be systematically and consistently planned through an agreed **public participation strategy or interaction plan (further in the text – strategy)**. This strategy should outline and specify **why, who, and how** stakeholders should be involved at different stages of MSP. The scope and content of the strategies typically go beyond the national minimum legal requirements.



**Figure 5.** Public participation strategy or interaction plan for MSP process.

The purpose of interacting (**why**) with stakeholders varies at different planning stages and respective needs of competent national authority coordinating MSP process. Since stakeholders have their own interests in sea uses the aims of stakeholders' involvement should be clearly defined to determine not only the process but also the expected outcomes of the interaction.



**WHY?** For example, it is essential to involve relevant stakeholders in the analyses of current situation to perceive the state of the environment, cultural values, economic demands and social trends, as well as their interaction. This is particularly important at early stages of MSP cycle, during the goal setting phase and initial discussions on vision and objectives. Early engagement also helps to identify multiple, specific interests, and find balance between safeguarding nature and promoting the growth of certain economic sectors.

The stakeholder analysis is a process that helps to understand **who** should be involved to be in line with EBA. The stakeholder analysis includes several activities, starting with the identification of stakeholders, characterizing them, mapping and assessing relationships, and other aspects such as their power, legitimacy ways and methods of interactions. If a public authority has an established long-lasting cooperation with its stakeholder groups, it is important to assess prior participation and interaction and apply the findings when planning the next round. In case the planning approach and context has been changed, a proper stakeholder analysis will ensure the smoother implementation. EBA emphasises importance of the nature and ecosystems, thus type of organisations (authorities, researchers, NGOs and community groups) who holds nature related data and knowledge as well who speak about nature conservation interests should be identified and participation established. Land-sea interactions also require that stakeholders are able to address not only marine ecosystems but also the land areas (such as beaches, shorelines, etc.).

Another important aspect of stakeholder analysis, in line with the EBA, is ensuring sufficient local and regional representation, especially as many countries develop their MSP at the national level. Involvement of the lowest appropriate level is mentioned in Malawi principles of ecosystem-based approach, which assumes multi-level governance as a basic approach for the EBA based ocean governance.

Depending on the context and the spatial coverage of MSP, the list of stakeholders to engage with will vary from country to country, as well as from planning task to planning task over time. The transparency of the process and the unlimited opportunity for anyone with an interest to join the planning process should be good practices. **WHO? A stakeholder salience model** is another approach to identifying stakeholders and segmenting them based on power, legitimacy, and urgency of interaction, thereby supporting the prioritization of engagement efforts. Another approach to stakeholder analysis is to classify stakeholders (**power matrix**) based on their level of influence or the impact of the planning document on them. A thorough understanding of stakeholders can help ensure a smoother MSP process and greater acceptance of its outcomes.

A conflict and synergy matrix, which displays positive, neutral, and negative interactions between various interests, can serve as a valuable tool to understand or anticipate potential conflicts among different sea user groups.

The role of international organisations such as HELCOM and VASAB could be also considered. They provide platforms for sharing MSP related knowledge and data across respective Baltic Sea region. Established HELCOM-VASAB MSP data expert group helps to harmonize both input and output data and develop common terminologies and visualization methods translating the data not only to planners but for public community.



The methods of participation and interaction (**how**) depends on purpose and also with whom the interaction is organised. Researchers will be able to deliver different type of contributions (e.g., data bases, evidence, scientific knowledge) compared to local stakeholder, e.g., local fisherman or tourism organisation. Yet, there are some overarching participation and interaction mechanisms practiced in the region:

- National MSP working group and/or steering group coordinates consultation process including communication of the environmental matters - composed of competent authorities, public bodies (e.g. regions, federal states, municipalities), blue economy business associations, and non-governmental organizations.
- Thematic working groups and networks – a number and type of the groups depends on the defined objectives, challenges, plan's content. These working groups come up with recommendations that stakeholders can already consider in the planning process to guarantee the achievement of environmental goals and sustainable social and economic development. Yet, it is important to bring together ones who care about nature and environmental qualities, or climate change.
- A scientific advisory board can provide valuable support for incorporating comprehensive scientific evidence into the MSP process. When the capacities of national scientific bodies are limited, it is advisable to include scientific representatives within the overall national MSP working group.

The success of interaction with stakeholders also depends on how and what MSP authorities communicate to the stakeholders. This leads to an increased understanding of how MSP works and what MSP can deliver for the environment and communities.

**HOW? Community of Practice (CoPs)** can be recommended as an innovative interaction platform. Community of Practice is an organized group of people who have a common interest in a specific area. They collaborate regularly to share information, improve their skills, and actively work on advancing the general knowledge of the matter. The structure of CoP includes two major components – a dialog platform planning and follow up period and time-bound drafting groups focused on the development of planning solutions or proposals for plan's adjustment.

The dialog platform is opened for unlimited number of stakeholders willing to participate in the planning and follow-up processes. Experience of the dialog platform will lay basis of the framework for continuous science and policy dialogue and mutual knowledge exchange between planners and stakeholders. Time-bound drafting groups might be established for the development of concrete planning solutions, resolving conflicts and assessing plan's impact with subsequent development of proposals for plan's adjustments. However, these drafting groups should fully utilize experience gained during discussions within the entire dialog platform and submit developed proposals to the CoP for verification. Coordination and facilitation of CoP are conducted by national competent authorities or national coordinating MSP workgroup.



Engaging with stakeholders throughout the entire MSP process can be facilitated through a series of regional and national workshops, sector-specific meetings, or individual consultations, all aimed at engaging stakeholders in a goal-oriented MSP process. The collaborative process builds stakeholders' trust in MSP authorities and fosters a shared understanding of their interests. However, the number of events should be balanced with practical feasibility. Therefore, it is crucial to prioritize the agenda to focus on addressing the most critical issues.

The getting and use of the **best available data and knowledge** is one of the actions to implement EBA at high-quality. Therefore, planners are interested to interact and use additional mechanisms such as interviews, data inquires based on **EBA reference list, common participatory GIS exercise, data sharing platforms**, etc. The cooperation on data and knowledge sharing is promoted through recent number of transboundary Baltic Sea and EU-wide projects such as Pan-Baltic Scope, Baltic-Lines, Baltic Sea2Land, Remap, eMSP NBSR and others. [The HELCOM Data and Map Service](#) is an online platform that provides open access to a wide range of geographic and environmental data related to the Baltic Sea region, as well as EU geo/data portals such as EMODnet at the pan-European level. Additionally, national geoportals established by the countries help share data and data products among national and cross-border stakeholders.

An important interaction in the process is **gathering feedback** from stakeholders and the public. Official procedures usually require comment periods during consultations on draft plans and environmental impact assessments. Consultations may also take a proactive approach, with multiple iterations to gather specific feedback on solutions and their impacts.

The Espoo Convention on Strategic Environmental Assessment supports **international and cross-border input** on potential environmental impacts, helping to enhance coherence in transboundary assessments. Involving stakeholders, especially environmental NGOs from other countries, can be crucial. A need for translation into the local language is important, as not all national, regional and local stakeholders are fluent in English. Some specific aspects of MSP's environmental impact can be considered in small targeted regional or bilateral working groups. For that, relevant international stakeholders should be identified during the stakeholder mapping process.

Effective communication and interaction between authorities and stakeholders can significantly **increase awareness**, especially when introducing new environmental concepts such as ecosystem services, the carrying capacity of ecosystems, environmental goals, and nature conservation and restoration targets. A clear and well-defined methodological framework, paired with user-friendly visualization tools (such as maps, diagrams, and graphs), helps convey prepared content of the plan, proposed planning solutions and impact assessment results to the general public in an accessible and visually engaging manner. This approach clearly illustrates what needs to be achieved and the changes that can be expected.

## Annex 1. EBA data reference list

Category	Sub-category	Dataset	Relation to climate change
Ecosystems and ecology	Benthic substrate	Biogenic environments (Reefs, mussel reefs, hap loops reefs, etc...)	x
		Rocky substrate (bedrock, etc.)	
		Sedimentary substrate (Mud, sand, gravel, rocks and boulders)	x
		Mixed substrate	
	Pelagic habitats	Deep environments (Deep waters)	x
		River plumes	x
	Other habitats	Reedbeds	x
		Artificial reefs	
	Haliutic fauna	List of observed fish species	x
		Endangered species colonies	x
		Functional areas and corridors (Nursery, spawning, feeding, breeding zones)	x
		Fish migration routes and significant areas	x
	Marine mammals	List of observed marine mammals (Include conservation status)	x
		Sedentary marine mammal colonies	x
		Functional areas and corridors (Resting, moulting, breeding zones)	x
		Marine mammal migration routes and significant areas	x
		Areas of seasonal high marine mammal density	x
		Areas of permanent high marine mammal density	x
	Avifauna	List of observed bird species	x
		Seabird colonies (Coastal and offshore)	x
		Functional areas and corridors (Nesting/roosting, feeding)	x
		Birds' migration routes and significant areas (Stopover sites)	x
		High density areas – Breeding season	x
High density areas – Wintering		x	



Category	Sub-category	Dataset	Relation to climate change
	Other fauna	Zooplankton and neuston	x
		Macro- and microzoobenthos	x
		Terrestrial animals	x
		Bats' migration routes and functional areas	x
		Turtles' functional areas and migration routes	x
	Flora	Phytoplankton (Flow cytometry recorders)	x
		Terrestrial flora	x
		Aquatic plant species (Algae, charophytes, water moss, angiosperms, etc.)	x
		Species of ecological or environmental interest (Posidonia oceanica, Laminaria hyperborea)	x
	Ecosystem processes	Other marine ecosystem processes	x
		Land-sea interactions	x
Zonal assessment and/or protection	Marine and coastal protected areas	Underwater cultural heritage	
		Reserves	x
		Natura 2000	x
		Other international MPAs	x
		Other MPAs	x
	Coastal erosion	Coastal erosion risk areas	x
	Ecological status assessment	Eutrophication and hypoxia	x
		Nutrient and oxygen backgrounds	x
		Ecological status and Biodiversity assessment	x
		Lost seabed surface area	x
		Chemical background	x
		Investigation of natural value	
		eDNA autosampler	
	Natural resources and Ecosystem services	Total catch (tons)	x
		Occurrence of red algae (Furcellaria lumbricalis)	x
		Natural resources	x
		Other provisioning and regulating ecosystem services	x
Cultural ecosystem services		x	
Geomorphology	Bathymetry,	Isobathymetric lines (20m/30m/50m/100m)	x



Category	Sub-category	Dataset	Relation to climate change
	geomorphology and landscapes	Coastal lagoons	x
		Estuaries and river deltas	x
		Bay areas (Narrow brackish water bay areas, Shallow marine bays)	x
		Flood meadows	x
		Fine sediment flats	x
		Sand or gravel formations (Sandbanks, dunes, etc.)	x
		Shoreline characteristics (Coastal erosion or accretion, type of coast)	x
		Other geomorphological structures	
Atmosphere parameters	Weather and wind	Wind speed (Median wind speed, vertical wind profile)	x
		Air temperature	x
		Dew point temperature	x
		Precipitations	x
	Climate and climate change related	Climate classification	x
		CO2 concentration in atmosphere	x
Predicted climate change effects		x	
Hydrodynamics and hydrography	Surface-level physical parameters	Total solar irradiation (sunlight)	x
		Water level	x
		Surface temperature	x
		Surface salinity	x
		Surface water reflectance spectrum	x
		Ice cover	x
		2D wave spectrum (wave buoy)	
	Water column description	Hydrographic structure (water layers)	x
		Thermoclines	x
		Haloclines	x
		Photic zone depth	
		Temperature vertical profile	x
		Salinity vertical profile	x
		Vertical profile of turbidity	x
		Vertical profile of fluorescence	
		Vertical profile of oxygen concentration	x
Incident light vertical profile			



Category	Sub-category	Dataset	Relation to climate change
		Composition of suspended material	x
		Vertical profile of Carbon Variables (pH, Dissolved CO2)	x
		Nutrient concentration vertical profile	x
		Primary and secondary productivity	x
		Vertical current profile	x
Human activities	Impact and pressure	Underwater noise	
		Noise above surface	
		Turbidity caused by human activities	x
		Fuel and oil pollution	x
		Toxic metal pollution	x
		Synthetic chemical pollution	x
		Plastic pollution	
		Treatment plant pollution	
		Electromagnetic fields caused by cables	
		Military explosion sound pressure level	
		Military explosion debris	
		Pathogens from aquaculture	x
		Air pollution	x
	Anthropogenic activities	Transport (Freight or passengers, both national and international)	x
		International uses (Cohabitation of cross-border users)	
		Export/Import by maritime routes	x
		Hunting water birds and marine mammals	x
		Mineral and fossil resources prospection and extraction (Sand, gravel, oil...)	x
		Coastal nourishments and other measures	x
		Multifunctional economic development	x
		Fisheries	x
		Transformation of seafood	x
		Sport, recreation	x
Scientific research and education	x		
Aquaculture	x		
Unexploded Ordnance and military dumping grounds			

Category	Sub-category	Dataset	Relation to climate change
		Dumping grounds	x
		Forest and silviculture area	x
		Coastline farming production	x
	Infrastructures	Economic activities areas	x
		Technical infrastructures	x
		Coastal large urban areas	x
		Ports, and harbor activities	x
		Nautical and naval sectors	x
		Industrial areas	x
		Cables, oil pipelines and communication lines	
		Marine renewable energies	x
		Thermal or nuclear power plant	x
		Artificial islands and installations	x
		Management restrictions and regulations (national security, defense, plans...)	Military restricted area
	Search and Rescue Area		
	Maritime boundaries		
	Maritime surveillance systems		
	Areas reserved for future development		x
	On-land urban planning dedicated to maritime activities (Radar protection zone, devices etc.)		x
	National maritime spatial plans (2 sets: delimitations and zoning)		x
Regional and sub-national maritime spatial plans	x		
Socio-economic data	Social indicators	Health and living conditions	x
		Income	
		Local benefits of the blue economy	x
		Tourism	x
		Economic and goods flows (Coastal and marine economic flows (e.g. Input-output matrix for coastal and marine sectors))	x
	Demography characteristics	Social situation	
		Employment	



Category	Sub-category	Dataset	Relation to climate change
Cultural data	Cultural ecosystem services	Nature-based activities like hiking, wildlife watching, recreational fishing, hunting, swimming, sailing, diving	X
		Aesthetic and inspirational values, spiritual and religious significance: Landscapes incl. underwater landscapes, art, literature, beliefs, sacred sites and rituals connected to the sea	
		Cultural identity and sense of place: Values and cultural connections with nature	
		Cognitive and educational aspects: Marine education, scientific and traditional knowledge, mental health and well-being	X
	Cultural heritage	Underwater Archaeological Sites: Shipwrecks, submerged settlements, ancient ports or docks	
		Marine and Coastal heritage: lighthouses, fortifications, harbors, historic fishing villages	
		Traditional Maritime Practices: indigenous fishing techniques, boat-building traditions	X