Baltic SCOPE

Towards coherence and cross-border solutions in Baltic Maritime Spatial Plans

EUROPEAN UNION
European Maritime and Fisheries Fund

Towards Coherent Cross-Border Maritime Spatial Planning in the Central Baltic Sea

Case Study Report From the Baltic SCOPE Project

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TOWARDS COHERENT CROSS-BORDER MARITIME SPATIAL PLANNING IN THE CENTRAL BALTIC SEA

CASE STUDY REPORT FROM THE BALTIC SCOPE PROJECT

MARCH 2017

EXECUTIVE SUMMARY

This report, Towards Coherent Cross-Border Maritime Spatial Planning in the Central Baltic Sea – Case Study Report From the Baltic SCOPE Project, is a report written by planners and for planners. It presents the methods used, data gathered and conclusions drawn from pioneering work in Maritime Spatial Planning (MSP) in the Central Baltic Sea area, conducted by planners and sectoral experts from Estonia, Latvia, and Sweden within the Baltic SCOPE project. The report is primarily targeted at experts from Baltic SCOPE partner countries, especially planners, both as a summary of the status and the state-of-the-art of development of MSP in the Central Baltic and as a base for future transnational collaboration. It can also inform a wider readership interested in MSP and spatial management of the Baltic Sea and beyond.

THE BALTIC SCOPE PROJECT

Increasing maritime activities in European seas and an uncoordinated use of coastal and marine areas have become problematic both for the marine environment and maritime-based economies. The rapidly growing need for marine space of different maritime sectors such as shipping, offshore energy production, fisheries and aquaculture implies increasing competition among them and negative effects on the marine environment. MSP has emerged as a comprehensive mechanism for a more efficient coordination of maritime activities and balancing with other marine values to promote a more sustainable use of marine resources and explore new economic opportunities.

The Baltic SCOPE project, running from 2015-17 and co-funded by the European Union (Directorate-General for Maritime Affairs and Fisheries (DG MARE)), was developed in response to these challenges and to the EU Directive on MSP, which emphasizes the need for greater cross-border integration and coordination of MSP activities in Europe's seas. The Baltic SCOPE project builds on previous MSP research and development projects in the Baltic Sea region. It has, however, been one of the first transnational projects on MSP, where responsible national authorities, supported by regional organisations and research bodies, collaborated to develop practical MSP with a transboundary perspective. The purpose was to increase coordination and promote collaboration between national authorities and other key MSP stakeholders, with the aim of finding common approaches to solve transboundary issues and enhance the alignment of national Maritime spatial plans in the Baltic Sea region.

In order to achieve this goal, the Baltic SCOPE project was divided into two case study areas, the Southwest Baltic and Central Baltic cases. The Central Baltic case study work was driven by Maritime Spatial Planning experts from the Ministry of Environmental Protection and Regional Development of the Republic of Latvia, in close cooperation with colleagues from the Ministry of Finance of Estonia and the Swedish Agency for Marine and Water Management (SwAM). Experts from research institutes (Nordregio and the Finnish Environment Institute (SYKE)) and the regional collaborations of the Helsinki Commission (HELCOM) and Visions & Strategies Around the Baltic Sea (VASAB) assisted them. Sector experts in thematic groups on environment, energy, fisheries and shipping and a special Ecosystem Approach Task Force contributed topical reports making an important basis of this report. The Central Baltic case study also had a particularly strong emphasis on involving sector stakeholders outside the project in an interactive manner, both in topical work, the analysis of cross-sector interactions and exploring how national stakeholders can be mobilized and involved in transboundary MSP.

THE CENTRAL BALTIC CASE STUDY AREA

The Central Baltic area covers the Exclusive Economic Zone (EEZ) and territorial waters comprised between Estonia, Latvia, and Sweden. Sweden meets Latvia and Estonia only in the EEZ boundary, whilst Latvia and Estonia share a boundary in the territorial waters in the Gulf of Riga. The Central Baltic area also includes four major islands: Hiiumaa, Saaremaa, Gotland and Öland. The countries in the case study area face common challenges in terms of demographic development, economic growth, unemployment (especially among young people), sustainable rural and urban development, and in some areas increasing environmental degradation due to the pressure of

growing human usage. The coast and the sea offer opportunities for so-called Blue Growth – the development of maritime activities to contribute to the economies of coastal areas. However, the highly sensitive marine environment is under increasing pressure and traditional uses of coasts and sea i.e. shipping and fisheries are facing competition in the marine space by new uses (energy, material extraction, tourism and recreation).

THE CENTRAL BALTIC APPROACH

Planners from the national authorities responsible for MSP in the Central Baltic countries met repeatedly in different constellations during the period of March 2015 to March 2017. In the absence of any clear transboundary conflicts between countries, the Central Baltic case study adopted a thematic, process-oriented approach focusing on four main sector areas: energy, environment, fisheries and shipping. This involved an assessment of the latest MSP developments at the national sector level, analysing planning evidence for cross-border MSP and the needs for knowledge and method development and highlighting transboundary conflict and synergy areas between sectors. Work in the project was divided into four main activity phases over a period of six months: a preparatory phase, an identification phase, a solution phase and conclusion phase, implying different steps of analysis, but moving increasingly towards cross-synthesis.

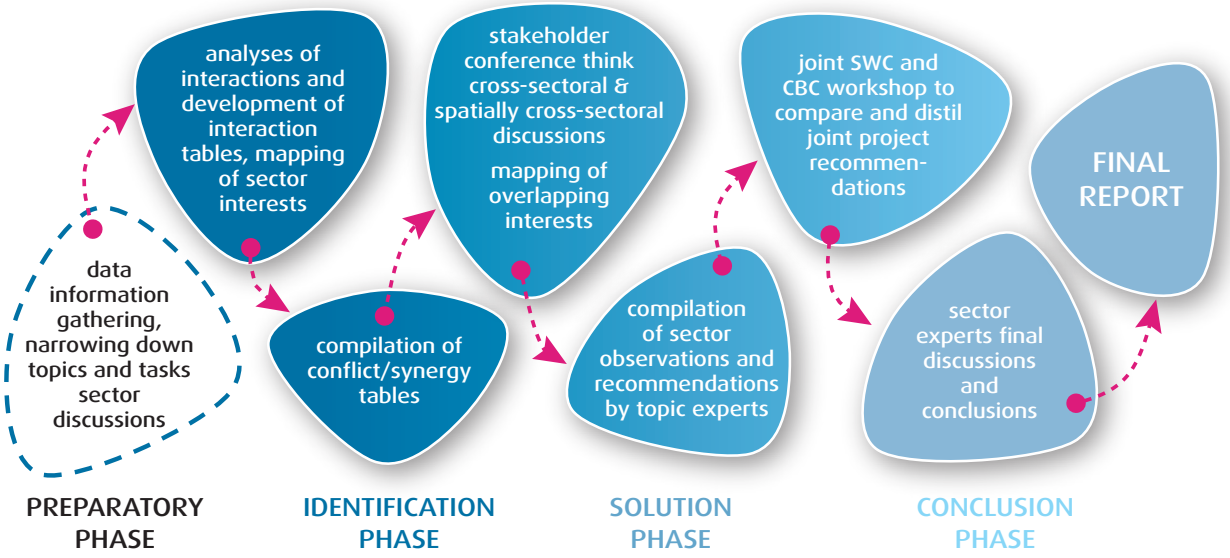

Figure 1: Central Baltic case study working steps (Source: Ministry of Environmental Protection and Regional Development of the Republic of Latvia).

Although no critical conflicts could be identified during the cross-sector discussions, the added value of engaging stakeholders into thinking in terms of potential conflictive or synergistic scenarios was that they could anticipate possible problems and opportunities. Essentially, as no planning decisions have resulted so far, this part of the work could be considered as some experimental simulation game but probing a real area and existing data with real stakeholders. Such an experience for stakeholders can support coherence between national Maritime spatial plans. Sharing knowledge can also enhance a common understanding between sectors, which provides a better basis for future decision-making.

THE CENTRAL BALTIC METHODS

A number of different methods have been used to drive the work within the Central Baltic case study. This includes methods for analysis from both a sector and a cross-sector perspective, interactive methods to enhance interaction and communication between planners and sectors, and methods to synthesise and integrate data within the case study area. The box below provides an overview of how the work within the case study evolved and the methods that were used.

The Central Baltic case study placed strong emphasis on stakeholder involvement as key to understanding the sectors' needs and demands in the use of the marine space. Methods such as thematic meetings, the World Café method and the Stakeholder Conference were successfully used for information sharing and to facilitate an interaction between sector experts and planners, to promote a common understanding and the identification of conflicts and synergies as well as potential solutions. The maps and interaction tables produced also provided some interesting insights on cross-sector overlaps.

BOX 1: METHODS USED IN THE CENTRAL BALTIC CASE STUDY

Step-wise Case Work

Analysis and knowledge-gathering for planning evidence:

- Topic papers
- Topic maps
- Cross-sector maps (bi-lateral)
- A combined map (overall)

Interaction:

- Planners' meetings
- Thematic meetings
- World Café method, for cross-sector interaction mapping
- The Stakeholder Conference
- A Workshop Session at the 2nd MSP Forum in Riga

Synthesis across sectors:

- Cross-sector conflict and synergy tables
- Overall conflict and synergy table
- Challenges and recommendations papers
- Final report writing

Cross-cutting Work

Project activities:

- Planners and project meetings - to discuss and interact across cases and groups
- Outreach events like Riga Kick-off and the 2nd MSP Forum in Riga

Pan-Baltic work within the project:

- Ecosystem Approach Task Force
- Joint green map for the Central Baltic based on Swedish experience
- Shipping density maps based on AIS-data developing out of the mapping exercise (by HELCOM)
- Assessment reports summarising knowledge during the preparatory and identification phases, including conflict and synergy tables for both cases and a project recommendations report based on interactive discussions and the project's internal survey (Nordregio)

CENTRAL BALTIC FOCUS AREAS AND MAIN FINDINGS

Cross-sector interaction in transboundary MSP in the Baltic is unprecedented. The general logic behind spatial, long-term and comprehensive planning, including MSP is novel for sector stakeholders. Both the sector experts and the planners have been challenged to understand each-other's needs, what information and tools are available and what opportunities MSP offers for improving the overall governance and management of the Baltic Sea. It requires time and trust for sectors to understand MSP as an approach and that it is not intended to replace sector management mechanisms. At the same time, planners need to get a sound understanding of the sectors' activities and spatial dynamics. Each chapter within the final report focuses on one key sector issue area. Each issue area contains an overview of the main issues and problems in each sector for the whole Central Baltic and the specific countries. Important findings from each focus area are outlined below (for details, see respective report chapters)

Sector status and trends: Chapter 3 provides an analysis of the current status and development of sector trends, focusing on the important economic drivers and other pressures in the Baltic Sea area.

- The marine environment is under high pressure by by many use sectors and suffering not the least from eutrophication, pollution and different types of disturbance of the seabed and alien species. The expected growth in most marine use sectors implies a growing pressure on the marine environment.
- The energy sector implies both connections and an increasing establishment of structures in the sea, not the least offshore renewables such as wind power. With changes in markets and climate policy, this new use is expected to increase.
- Fisheries (here - commercial), is a traditional use of the sea and is essentially transboundary, both regarding the resource and fishing itself and has important sea-land connections. It is affected by ecosystem changes such as climate change. It is under pressure by expanding other uses.
- Shipping is a traditional use of the sea with an important role for regional economic development and land-sea interaction through ports. Also, shipping is expected to increase both by volume and the amount of vessels in the Baltic. Climate change might affect the need for safety distances.
- Climate change is affecting both marine uses and the environment. The pressure on sensitive marine ecosystems especially in shallow and coastal areas is expected to increase.
- There is a need for spatial visualization through mapping exercises and analysis of data and their availability.
- There is a lack of consistent data on basic environmental conditions and present marine uses, but also of prognoses/future perspectives in some sectors.

Institutional frameworks and procedures for sector planning: Chapter 4 outlines a combined picture of respective marine planning and management systems across sectors, as different countries adopt different institutional approaches and are at different stages of the planning process.

- The three countries are at different stages early in the MSP cycle. Estonia has some pilot plans for specific areas and is at the beginning of its first overall planning cycle, Latvia is moving towards governmental approval of the first ever marine spatial plan and Sweden is presenting first drafts to a broader public. Their systems differ also in other dimensions, which needs to be taken into account when doing transboundary MSP.
- MSP is embedded in international and regional regulations and agreements, regional strategies and guidelines and national regulations and strategies. Therefore, MSP has to be aware of a number institutional actors and crucial regulations at different levels.
- Environmental regulation is most complex and encompasses all levels, whereas the energy and fisheries regulation is concentrated at the EU-level, while global regulations actors, such as the International Maritime Organization (IMO), guide shipping.
- A starting point for effective cross-border cooperation is to agree on definitions and approaches based on an understanding of the different institutional frameworks between countries.

Available sector planning evidence: Chapter 5 develops a combined picture on the data available on sector interests and needs, and the type of information used in MSP processes based on the pioneering common mapping exercises prepared by the planners and sector experts. This is presented in the first common maps and availability tables based on data for different sectors that might be of interest beyond the case study. Important conclusions from this work are:

- Considerable steps towards common maps have been made through these mappings for different sectors, even if many maps cannot be used as proper planning evidence yet. It has been easiest for the shipping sector, as transboundary data collection using a specific method, is already in place.
- There is fragmented data collection across countries, regarding environment, energy, and fisheries and also other uses that are necessary in planning for these sectors.
- Countries differ in data, methods, and evidence used for making planning decisions.
- There is a need for more harmonized data as well as collection and assembly methods to highlight sector interests and guide transboundary discussions.
- Joint maps are necessary, showing the zoning from different national marine spatial plans (output data).
- Geospatial data needs to be publicly accessible and available at the DG MARE MSP platform.
- Pan Baltic maps to represent different sectors should be created by the joint collaborative effort of organizations like the International Hydrographic Organization (IHO), The International Council for the Exploration of the Sea (ICES), HELCOM, and others.
- The Central Baltic experts support the input/output data mapping approach of the HELCOM/VASAB data subgroup, including main data sets for each sector relevant for MSP.

Cross-sector interactions and planning challenges: Chapter 6 reports on cross-sector analysis both with stakeholders and sector experts and within the Planners' Group. For cross-sector analysis, the case study used interactive group methods and cross-sector bilateral interaction tables as well as a comprehensive map. Based on the Stakeholder Conference a first *Comprehensive Conflict and Synergy* Table was also produced.

The comprehensive map *The Complexity of Current and Possible Future Uses in the Central Baltic Sea* is pioneering work, the first ever attempt to compile information on all four sectors for the Central Baltic Sea. It may seem confusing in its complexity, yet MSP is a tool to resolve such

confusion. The map contains both existing uses and interests for future sea use and provides an opportunity for stakeholders to learn about spatiality. It indicates merely a few transboundary and cross-sector conflicts among the three countries, while there may be more conflicts both within a single country and beyond the case study.

The *Comprehensive Conflict and Synergy Table* condenses cross-sector conflicts and synergies identified by the stakeholders. It can be seen as indicating first steps towards identifying important conflicts and ways to look for solutions, but is no proper planning tool yet. Its level of detail differs too much across sectors, due to the sector representation. The synergies can be interpreted as potential for co-existence of different sectors and even positive impacts on other sector's aims (and possibilities to mitigate conflicts by MSP). Also, the conflicts are based on potentials and concerns rather than real current conflicts, as many can be mitigated by MSP requirements.

Based on the analysis, methodologically, some attention needs to be paid to:

- The degree of representing reality and the approaches used in mapping differ between countries and also within one country between sectors (existing, concretely planned, envisioned).
- What maps actually show: the degree of alignment in a map is not necessarily an indicator for the presence or absence of conflicts; matching lines do not necessarily represent the same thing.
- Uncertainty: the first round of MSP usually implies high uncertainties; knowledge on different bio-geophysical processes in the sea is lacking. Thus, planning may need to be more directional and less binding at this stage.

A combined reflection of both the overall map and the Conflict and Synergy Table suggests that regarding the majority of overlaps in the sea space sector interests may actually coexist. The exercise, as such, was an important step towards attaining conclusions and recommendations in Central Baltic case-work. Sector representatives need to understand MSP as an approach not intended to replace sector management mechanisms, while planners need to deepen their understanding of each sectors' activities, spatial dynamics and institutional conditions.

CENTRAL BALTIC CONCLUSIONS AND RECOMMENDATIONS

The Baltic SCOPE project has been successful in developing transnational linkages and cooperation in MSP between the participating three Central Baltic countries, and has created the foundations for meaningful, lasting cooperation and harmonised plans (Chapter 7). The participating planners and sector experts have established a common understanding of developments in important marine use sectors in the Central Baltic Sea. A better knowledge of each country's institutional frameworks and planning culture developed and the understanding of similarities and differences has increased. By working together on common maps, the need for planning evidence and important data, and the need to address method gaps has been highlighted. It does not appear meaningful to synchronise national MSP and have common plans; the participating countries' approaches and priorities differ, and this is likely to remain so. The involvement of national stakeholders (both governmental and non-governmental) appears to have deepened their understanding of both MSP and their potential role in it, hopefully increasing their motivation to play an active role.

Based on case work, the Central Baltic planners have identified a number of gaps and formulated **sector specific recommendations** related to integrating the specific sectors and their needs into MSP, promoting their institutional integration and efficiently working with improving the rather insufficient transboundary planning evidence.

- For the **environment**, there is a need to establish a consequent ecosystem perspective on managing open ecosystems, such as the sea, through MSP (in problem analysis and data collection, planning and Environmental Impact Assessments (EIA)). Practically, this implies enhancing the connectivity of marine ecosystems, developing common standards (e.g. in relation to the implementation of the Marine Strategy Framework Directive (MSFD) and Marine Protected Area (MPA) networks), improving the transboundary harmonisation of data collection methods and their availability, and developing the concept of green infrastructure maps, where the case study has already conducted pioneering work. Further work and a deepening of the understanding on the implications of climate change for MSP are necessary.
- For **energy**, the development of a pan-Baltic perspective on the energy sector and cross sector analyses of the implications of offshore energy developments should be promoted. There is also a need to include specific stakeholders, such as relevant transnational working groups, into the MSP dialogue, create a stakeholder list, promote the evaluation of ecosystem aspects at a much earlier stage of energy planning (not just at the end of project planning), and to focus on cumulative effect assessment both for the whole Baltic and across sectors.
- For **fisheries**, it is important to consider the dynamics of both users and resources, and to have a transnational pan-Baltic perspective in the understanding of the sector; this requires the production of maps with a transboundary perspective and harmonised methods for data collection and representation. This is best done by including important data actors such as the sector itself and e.g. ICES in the process of method development.
- For **shipping**, there is a need to include the sector's relevant actors with a mandate at the planning table as early as possible in the MSP process. One should also promote an understanding of national differences in representing the sector on maps and work for finding a way to link shipping routes appropriately across borders, and using MSP in a transboundary manner to analyse potential re-routings that can later be proposed to the IMO. Data on other sectors (e.g. ecological values) should be provided in a transboundary manner and good conditions ought to be facilitated for the transboundary exchange of data, all the while including relevant organisations such as the IMO, HELCOM, and the HELCOM-VASAB data subgroup.

Considering the general patterns across sectors, it is important to include those with relevant mandates early in the MSP process, to further promote the common understanding of MSP systems and the understanding of how sectors are regulated across boundaries. It is important to harmonise data collection and the production of planning evidence in order to achieve pan-Baltic data exchange and create common maps. This may also mean the inclusion of important actors in this area in further work. More specifically, from an overall cross-sector perspective, **to develop transboundary MSP** in the Central Baltic even further, **the following important obstacles need to be overcome:**

- **Clarifying the relation between sector management and MSP**: Maritime Spatial Planning as a new approach is still questioned and tested, not the least in comparison with traditional sector planning. In many sectors, the understanding of responsibilities needs to be deepened (distribution of roles). A transboundary context implies complications, as the right to plan according to international agreements and regulations usually falls under the responsibility of national states. Moreover, MSP is not only about prioritising by zoning. Other types of measures may be linked to it as well (e.g. in environmental management).
- **Operationalising ecosystem-based MSP:** So far there is no properly adopted, implemented ecosystem-based approach in MSP. For a start aid by checklists, see

the Baltic SCOPE EBA report (Schmidtbauer Crona et al. 2017). Different countries are now under way with first attempts, using the best available data to define sensitivity and values of marine ecosystems. For meaningful transboundary planning a common approach to evaluate cumulative pressures of uses is needed. Moreover, the coherence of MPA-networks in the Baltic Sea should be studied and possible roles of MSP in enhancing such coherence should be clarified.

- **Establishing structures an d standards for knowledge exchange:** Data and information exchange between countries is limited by national data dissemination rules and a lack of common standards for data content and visualisation. An informal exchange of information prevails. Combining digital information is technically feasible but requires an agreement on standards for both content and visualisation, thus a common data platform needs to be developed. The work of the HELCOM-VASAB Maritime Spatial Planning Data Expert Sub-group[1] and other relevant initiatives could create the basis for the development of a pilot project for a Baltic Sea data platform.
- **Timing and evaluating MSP:** Different timelines for national processes are likely to continue complicating cross border knowledge exchange in the future, as well. For the coming years, European DG MARE funding will keep playing an important role in strengthening transnational collaboration on data. As mentioned, the three Central Baltic countries are at different stages of developing their first generation of plans. It might be possible to evaluate the different approaches only once these are ready. Meanwhile, collaboration-projects such as this one make it possible to exchange ideas and take a few further steps forward towards further integration of sectors and across boundaries and sectors.
- **Overcoming language barriers:** if plans are available only in national languages, early transboundary cooperation is difficult. A translation of all documents at all marine-planning stages would be ideal, at least into English.
- **Establishing an official, permanent mechanism for cross-border coordination:** establishing common methodologies, (e.g.) criteria and standards require a transnational process (formal or informal) resulting in agreements by experts and countries. This can be carried out under the auspices of organizations such as VASAB and/or HELCOM, involving sector organizations, such as ICES, IMO, or through collaborative projects. Nevertheless, an officially institutionalised permanent mechanism for cross-border coordination is required in the end. Without such mechanisms, results and proposals from projects are not sustained and can be lost in the long run.
- **The need to go beyond ad-hoc and project-based work:** With the present project based, ad-hoc cooperation on specific sea use conflicts, it might become difficult to establish coherence between national Maritime spatial plans and evaluate them. Furthermore, such cooperation tends to mainly solve perceived problems and be not proactive and strategic for MSP.

Baltic SCOPE has come a fair way, but transboundary MSP in the Central Baltic can be developed even further. For this purpose, the above points are especially important to tackle. The partners' collaborative spirit and enthusiasm and the experiences gained through Baltic SCOPE make a valuable basis to successfully address them. Last but not least, it is strongly suggested to implement the overall Baltic SCOPE project recommendations; developed on the basis of the present case study work.

1 See http://www.vasab.org/index.php/maritime-spatial-planning/bsr-msp-data-esg.

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ABBREVIATIONS

Abbreviations	Specification	Comment
AIS	Automatic Identification System	Tracking system for larger vessels
BaltFish	The Baltic Sea Fisheries Forum	EU regional forum for fisheries management
BEMIP	Baltic Energy Market Interconnecting Plan	Important energy sector plan in the Baltic Sea
BIOR	Institute of Food Safety, Animal Health and Environment	Situated in Latvia
BSPA	Baltic Sea Protected Area	Environmental protection scheme for the Baltic Sea by HELCOM (type of MPA)
CB	Central Baltic	Case study area
CBD	Convention on Biodiversity	United Nations convention to protect and promote biological diversity
CEF	Connecting Europe Facility	Funding instrument to realise European transport infrastructure policy
CFP	Common Fisheries Policy	EU-policy on fisheries
CICES	Common International Classification of Ecosystem Services	System developed by the EEA, see http://cices.eu/
COLREG	Regulations for Preventing Collisions at Sea	Global shipping regulation
DG MARE	Directorate-General for Maritime Affairs and Fisheries	European Union directorate
DSO	Distribution System Operators	Energy management
EC	European Commission	European Union executive
EE	Estonia	Central Baltic case study country
EEA	European Environment Agency	European Union agency
EEZ	Exclusive Economic Zone	200 NM zone where each national state has special use rights according to UNCLOS
EFH	Essential Fish Habitat	Areas defined as essential for certain fish species
EFIS	Estonian Fisheries Information System	
EIA	Environmental Impact Assessment	Required for specific projects
ENTSO-E	European Network of Transmission System Operators for Electricity	European level energy actor
ERS	Electronic Reporting System	Used among other in fisheries sector
ETS	EU Emission Trading Scheme	Sets the price for CO2 emissions
EU	European Union	
FIS	Fisheries Information System	
GDP	Gross Domestic Product	Measure of economic productivity in a region
GIS	Geographic Information System	
GES	Good Environmental Status	Objective according to European MSFD and WFD.
GORWIND	Gulf Of Riga as a resource for WIND energy	Wind energy project
HELCOM	Helsinki Commission	Environmental Intergovernmental Organisation

Abbreviations	Specification	Comment
HVDC	High Voltage Direct Current	Energy sector
IBA	Important Bird and Biodiversity Area	As defined by the NGO BirdLife International
ICES	The International Council for the Exploration of the Sea	International data host, consulting and data integration organisation
IHO	International Hydrographic Organization	Global governmental organisation
IMO	International Maritime Organisation	United Nations organ for maritime affairs
IMP	Integrated Maritime Policy	European union policy
IUCN	International Union for the Conservation of Nature	United Nations organ for conservation
kV	KiloVolt (1000 V)	Energy measure for tension
LIAE	The Latvian Institute of Aquatic Ecology	
LV	Latvia	Central Baltic case study country
MARPOL	International Convention for the Prevention of Pollution from Ships	Global convention
MAES	Mapping and Assessment of Ecosystems and their Services	EC working group for implementation of Task 5 of the EU Biodiversity Strategy 2020
MPA	Marine Protected Area	Marine conservation area, different types include: national park, NATURA 2000, reserves etc.
mps	Meters per second	
MSP-Dir.	Maritime Spatial Planning Directive	European Union directive
MSFD	Marine Strategy Framework Directive	European Union directive
MSP	Maritime Spatial Planning	
MV	Megavolt (1'000'000 V)	Measure for electrical tension
MW	Megawatt	Measure for power
NM	Nautical Mile	Ca 1.8 km
OSW	Offshore Wind	Marine energy production form
PoM	Program of Measures	Related to the implementation of EU MSFD
PSSA	Particularly Sensitive Sea Area	Pollution protection scheme for shipping, declared by the IMO.
RES	Renewable Energy Sources	e.g. wind power, wave power, tidal energy
SAMBAH	Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise	Ecological monitoring system
SE	Sweden	Central Baltic case study country
SEA	Strategic Environmental Assessment	Required for other maritime plans
SOLAS	International Convention for the Safety of Life at Sea	Global vessel safety regulation in the shipping sector
SwAM	Swedish Agency for Marine and Water Management	
SYKE	Finnish Environment Institute	
TAC	Total Available Catch	Used in the fisheries sector and the CFP
TEN-T	Trans-European Transport Network	European network for shipping
TSS	Traffic separation scheme	For maritime traffic
TSO	Transmission System Operator	Operators of energy transmission systems
TWh	Tera Watt hours	Energy measure for power
TYNDP	Ten Year Network Development Plan	Energy network development plan by ENTSO-E
UNCLOS	United Nations Convention on the Law of the Seas	United Nations convention
VASAB	Vision & Strategies Around the Baltic Sea	An intergovernmental multilateral co-operation of 11 countries of the Baltic Sea Region in spatial planning and development
VMS	Vessel Monitoring System	Used in shipping
WFD	Water Framework Directive	European Union directive
WGSFD	Working group on spatial Fisheries Data	Part of ICES

INTRODUCTION

In the last decades, marine ecosystems globally have experienced increasing pressure through a developing sea-based economy, including increasing demands for commercial use of marine space. This has triggered concern for the development of an adequate governance of marine ecosystems (Backer, 2011), both spatially and from an ecosystem perspective. Not the least the Baltic Sea, which has experienced strong economic growth resulting in increasing pressure on its highly sensitive ecosystems. Important activities and sectors include shipping, wind energy production, pipelines and submarine cables, and commercial fishing. These activities have to share limited space and be in balance with the need to preserve marine ecosystems' capacity to provide important goods and services.

The Baltic SCOPE project, financed by DG MARE, was developed in response to the EU Directive on Maritime Spatial Planning[2] (MSP) that outlined the need for greater cross-border integration and coordination of MSP activities in European sea basins. Baltic SCOPE is designed to increase collaboration between national authorities and sector stakeholders in the Baltic Sea region, in order to help find solutions to cross-border issues and to increase the alignment of national Maritime spatial plans. Baltic SCOPE builds on previous MSP research projects in the Baltic Sea region, namely BaltSeaPlan[3] (Interreg IVB, 2009-2012) and PartiSEApate[4] (Interreg IVB, 2012-2014); however, Baltic SCOPE adds further value and novelty by going beyond basic research, turning the role of researchers into facilitators on the one hand and by bringing together national planning authorities to find concrete solutions to cross-border MSP issues.

In order to achieve the project goals, practical work was divided into two case study areas, the Southwest Baltic and Central Baltic cases. The Central Baltic is regarded as a vital area for MSP activities in the Baltic Sea Region as it covers the territorial waters and EEZ comprised between Estonia, Latvia and Sweden. Baltic SCOPE brings together planners from the national authorities responsible for MSP in the three Central Baltic countries (Table 0). The planners met repeatedly in different constellations during the period of March 2015 to March 2017, with the aim of identifying areas of potential coordination and developing joint recommendations to solve cross-border MSP issues.

Table 1: Participating planning authorities in the Central Baltic case study

Country	Authority (Partner in Baltic SCOPE)
Estonia	Ministry of Finance of Estonia
Latvia	Ministry of Environmental Protection and Regional Development of the Republic of Latvia
Sweden	Swedish Agency for Marine and Water Management (SwAM)

2 See https://ec.europa.eu/maritimeaffairs/policy/maritime_spatial_planning_en.

3 The BaltSeaPlan project aimed at generating a joint understanding of MSP in the Pomeranian Bay area by looking into the available information and data and getting an idea of data comparability across borders. Read more: http://www.baltseaplan.eu/

4 The PartiSEApate project focussed on governance, stakeholder interaction and transnational consultation. This project took a deeper look into cross-border issues and processes, and developed general recommendations for cross-border / transnational cooperation and consultation in MSP. Read more: http://www.partiseapate.eu/

The Central Baltic group worked with issues in the areas of shipping, fisheries, energy and nature/environment, which had been identified as key sectors to promote coherent transboundary MSP both in the Central Baltic case and in the Baltic SCOPE project as a whole. Partners in the Central Baltic unpacked each of these sectors' spatial needs by elaborating Topic Papers and through Thematic Meetings with stakeholders in order to identify potential conflicts and synergies and important areas of collaboration. Moreover, planners developed joint maps for shipping, green infrastructures and more, which were useful to visualize the current uses of the Sea area across national borders. The Central Baltic Planners' Group adopted a thematic approach to their discussions and analysis, seeking common understanding and potential solutions in cross-sector and cross-border areas.

This report is written by planners and for planners. It presents the methods used, data gathered and conclusions drawn from pioneering work in MSP in the Central Baltic Sea area, conducted by planners and sectoral experts from Estonia, Latvia, and Sweden within the Baltic SCOPE project. The report is primarily targeted at experts from Baltic SCOPE partner countries, especially marine planners, both as a summary of the status and the state-of-the-art of development of MSP in the Central Baltic and as a base for future transnational collaboration. It can also inform a wider readership interested in MSP and spatial management of the Baltic Sea and beyond.

This final report from the Central Baltic case study is structured as follows. Chapter 1 provides a contextual overview of the Central Baltic case study area. Chapter 2 is an outline of the approach adopted in the project. Chapter 3 provides a synthesis of current status and trends in four important main marine sectors (environment, energy, fisheries and shipping), followed by a description of relevant institutional framework and procedures in chapter 4. In chapter 5, the data and planning evidence situation is analysed, based on the planners' attempts to develop common maps for the Central Baltic. Chapter 6 reviews results and methods for analysing cross-sector interactions, those used to promote cross-sector thinking beyond planning experts. Chapter 7 provides a sector-wise synthesis of important challenges identified in the earlier analysis and develops recommendations for future transboundary MSP work in the Central Baltic and beyond. The appendix includes comprehensive references.

1. CENTRAL BALTIC CASE STUDY: CONTEXT AND PLANNING STATUS

1.1. THE CENTRAL BALTIC CASE STUDY AREA: CONTEXT

This chapter provides a contextual overview of the Central Baltic Sea area and outlines the main approach and methods adopted by the planners during the course of the Baltic SCOPE project. The case study area covered is shown in Fig. 1.1-1.

Figure 1.1-1: The Central Baltic case study area in red (Nordregio)

The Central Baltic area covers the EEZ and territorial waters comprised between Estonia, Latvia and Sweden. Sweden borders Latvia and Estonia only in the Exclusive Economic Zone (EEZ) boundary, whilst Latvia and Estonia share a boundary in the territorial waters in the Gulf of Riga. The Central Baltic area also includes four major islands: Hiiumaa, Saaremaa, Gotland and Öland. Figure 1.1-2 provides an overview of the area, showing municipalities, urban areas, respective territorial waters and EEZ as well as population size on a municipal level in circles of different sizes illustrating a range from 10,000 to 500,000 inhabitants, whereas the circles' various colours indicate the estimated municipal population change between 2015 and 2025. The Central Baltic area includes major cities with more than 200,000 inhabitants, namely Stockholm and Riga and a number of small and medium sized cities.

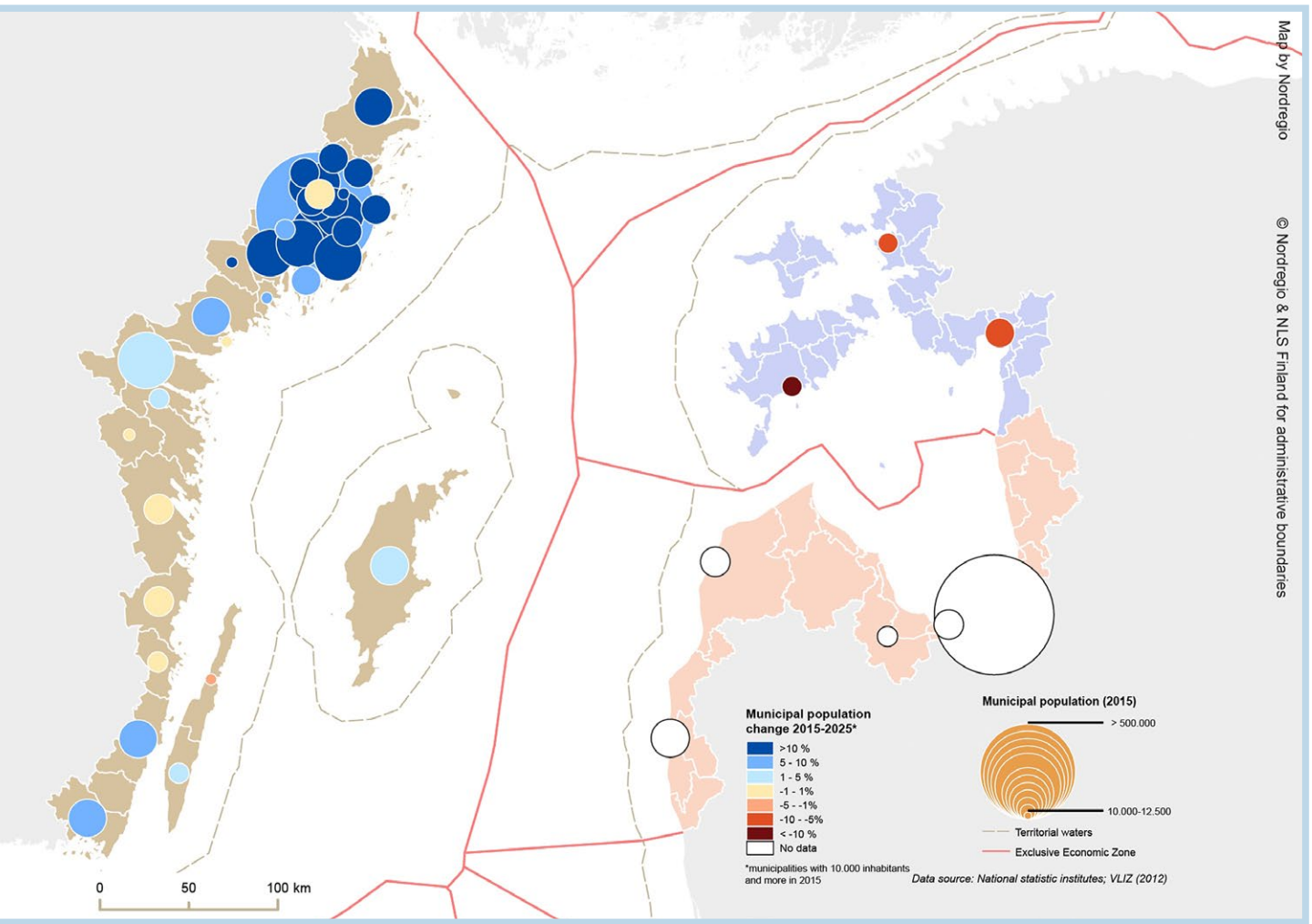
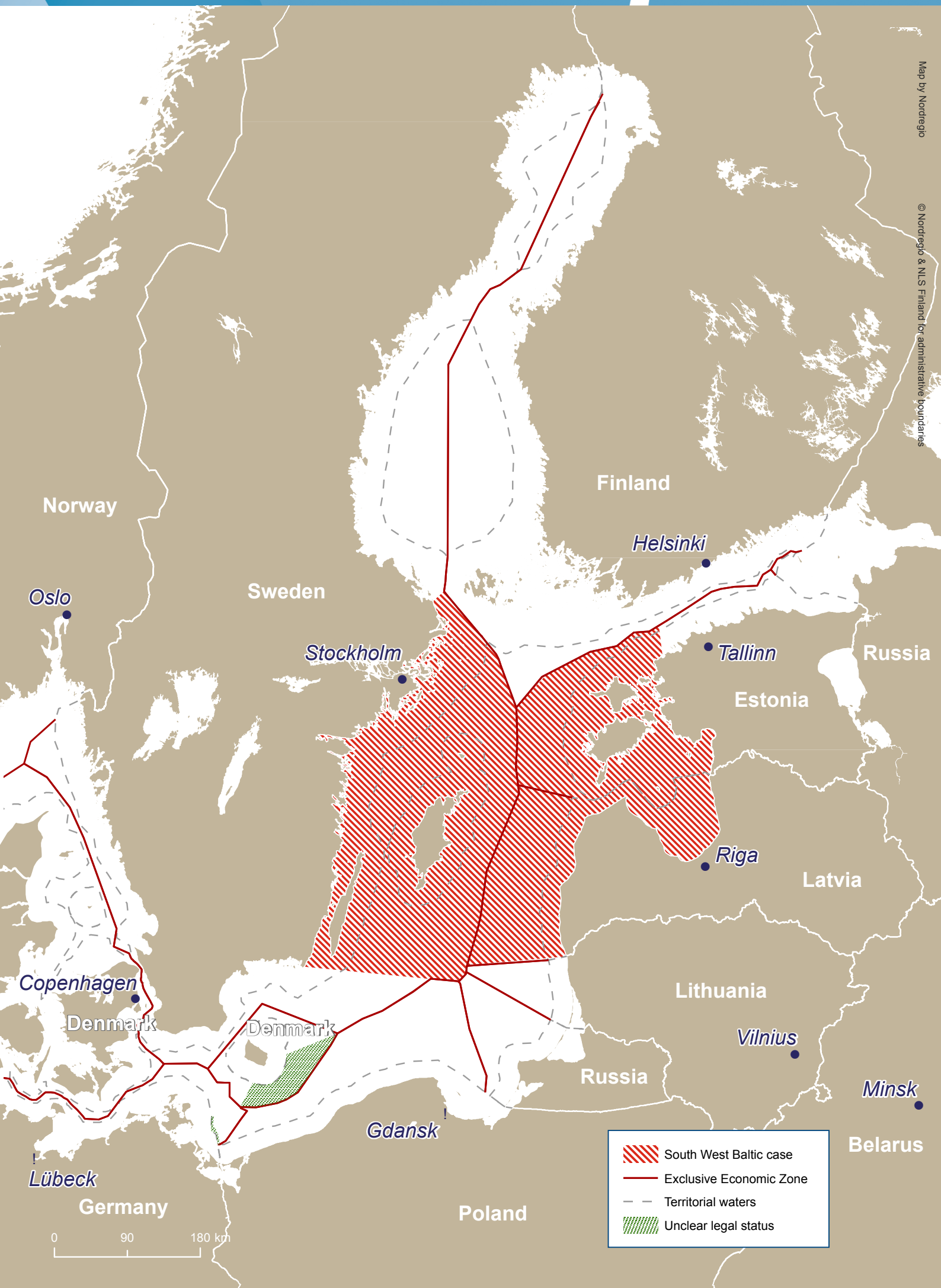


Figure 1.1-2: The Central Baltic case from a land-sea perspective in 2015 (Nordregio)


Map by Nordregio
© Nordregio & NLS Finland for administrative boundaries
Norway
Finland
Helsinki
Oslo
Sweden
Stockholm
Tallinn
Russia
Estonia
Riga
Latvia
Copenhagen
Denmark
Denmark
Lithuania
Vilnius
Russia
Minsk
Gdansk
Belarus
Lübeck
Germany
Poland
South West Baltic case
Exclusive Economic Zone
Territorial waters
Unclear legal status
0
90
180 km

The Gross Domestic Product (GDP) per capita tends to be higher in larger urban centres, particularly in capital cities, whereas rural regions tend to be less productive. Figure 1.1-3 shows a higher GDP per capita in the metropolitan regions of Stockholm and Riga than in the cities' neighbouring regions. This is also the case of Tallinn, Estonia's capital region, even though the map does not show it, since it lies beyond the case study area. Moreover, there is also a significant variation between those cities. While the highest GDP per capita is found in Stockholm with a >150% of the EU's average, Riga ranges between 100-125% of EU's GDP per capita average (in 2013). Similar variations exist between rural regions, where those showing higher indicators are located in Sweden, and those with lower indicators are located in Latvia and Estonia. Yet, there is a general tendency for GDP per capita values, to be lower than the EU's average in rural regions across the whole Central Baltic case study area.

The countries in the case study area face common challenges in terms of demographic development, economic growth, unemployment (especially among young people), sustainable rural and urban development and increasing environmental degradation due to the growing pressure of human use. The coast and the sea offer opportunities for Blue Growth – development of maritime activities to contribute to the economies of coastal areas. However, the highly sensitive marine environment is under increasing pressure and traditional uses of coasts and sea i.e. shipping and fisheries are facing competition in marine space by new uses (energy, material extraction, tourism and recreation).

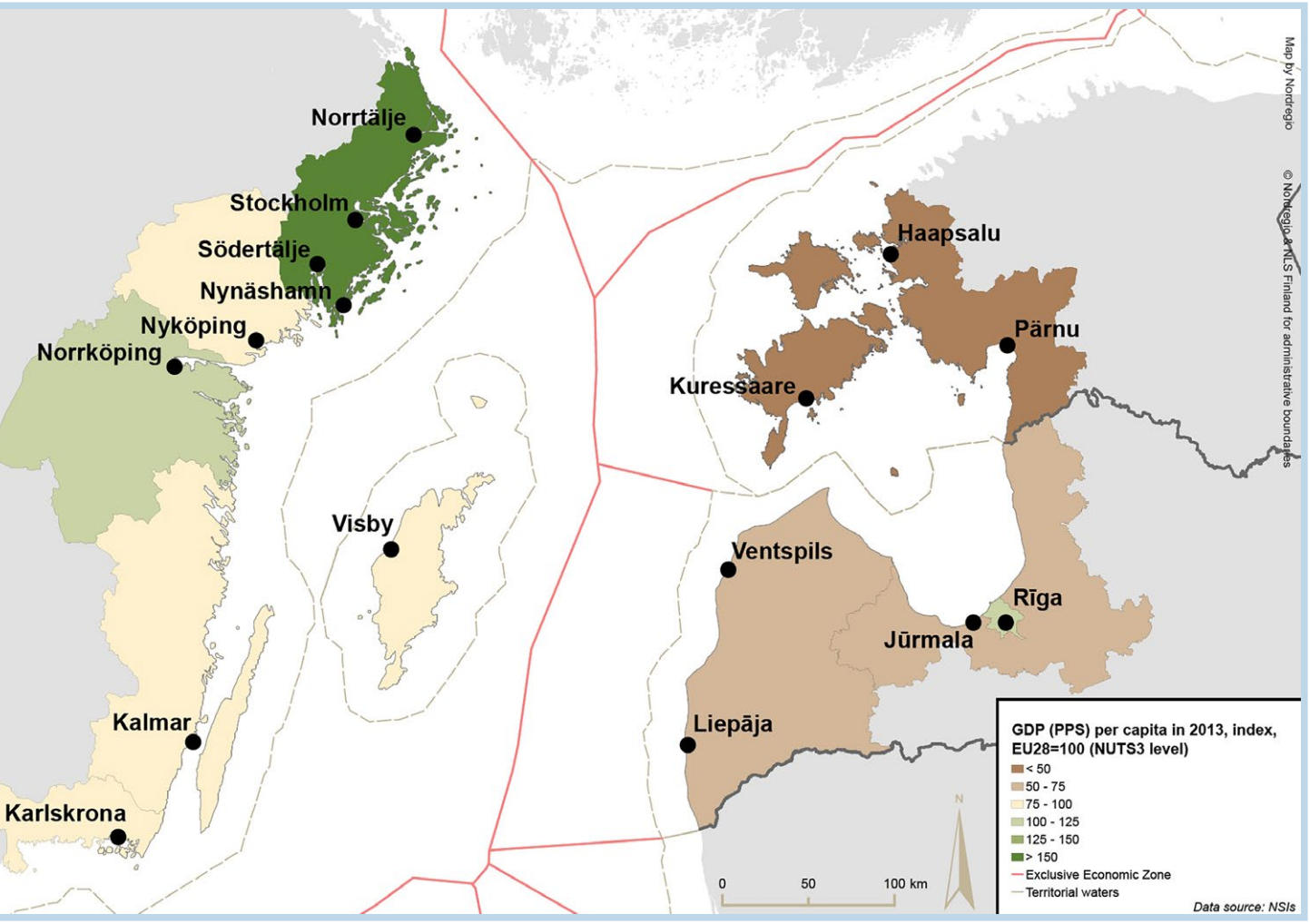


Figure 1.1-3: GDP in the Central Baltic case study area (Nordregio)

1.2. MSP STATUS IN THE CENTRAL BALTIC CASE

In order to address existing and future challenges in the Baltic Sea, and in accordance with the EU's MSP directive, the three Central Baltic countries are developing their marine and coastal planning. Pioneering work is currently being done in institutional development and actual spatial planning in the shared marine area. One key challenge is that the planning processes are not conducted in parallel but are at different stages and typically run according to different timelines and use different approaches. This is also valid for the Central Baltic countries (Fig 1.2-1). An overview over the planning systems and the institutional frameworks for sector management can be found in chapter 4. At the time of finalizing this report (January 2017), the planning status in these countries was as follows:

Estonia is still in the early planning cycle; an overall national MSP process is under way. Two pilot plans already exist for the areas around Hiiu Island and within the Pärnu Bay. These will remain valid when new national marine spatial plans are adopted.

Latvia is at the drafting stage; a draft plan was presented in 2016 (Ministry of Environmental Protection and Regional Development of the Republic of Latvia 2016) and a separate coastal thematic plan (ibid. 2016a) has already been adopted. During the ongoing MSP process Latvia and Estonia are seeking to establish coherence in the Gulf of Riga.

Sweden is also at the drafting stage. In December 2016, SwAM presented a first set of draft plans, asking for a response at an early stage.[5] There are three draft plans: one each for the Bothnian Bay, the Baltic Sea and the Western Waters (Skagerrak/Kattegat), with the Baltic Sea plan including the case study area. These plans will be of strategic character and not legally binding, but can include binding provisions. There will be two more phases of consultative public review until SwAM presents the final plan versions for adoption to the government in 2019.

In parallel to the project, the countries also held bilateral consultations on their ongoing processes during 2015-16. Being at different, often intensive stages in designing national plans for the first time, along with collaborating in a transnational MSP project has been challenging but has also provided opportunities for participants to analyse, discuss and learn together. The next section presents important features of the Central Baltic case study approach. The results of this analysis and the resulting knowledge base, reflections and conclusions make the rest of this report.

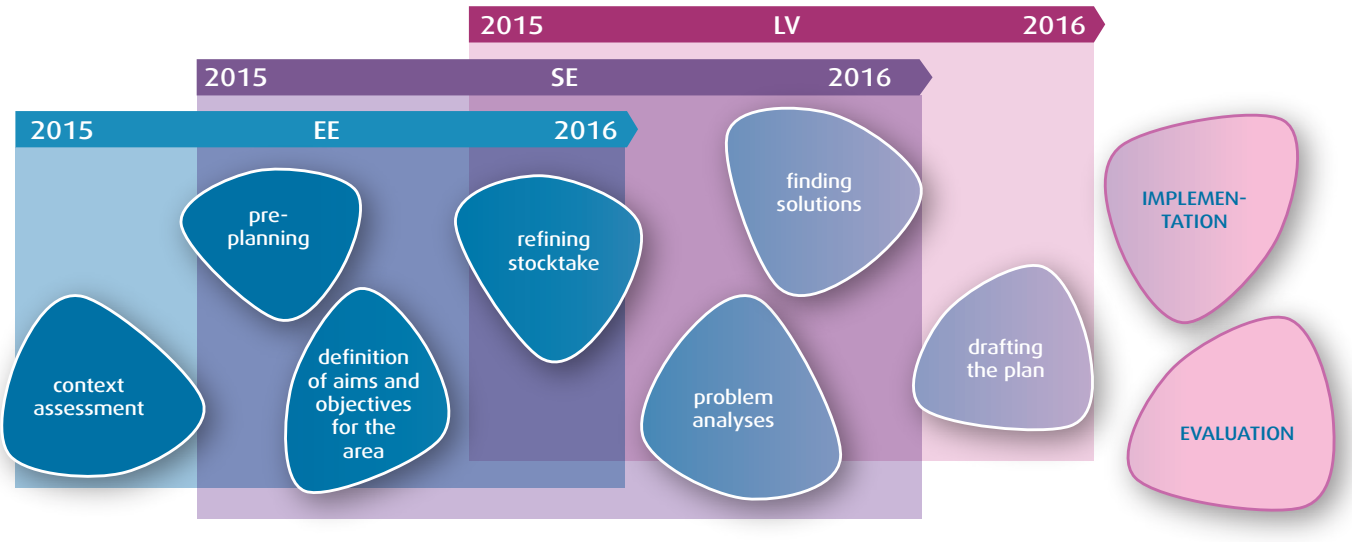


Figure 1.2-1: Status of national MSP processes during the Baltic SCOPE project (arrows) in relation to an overall planning process cycle (Source: Ministry of Environmental Protection and Regional Development of the Republic of Latvia).

5 Swedish plan drafts (in Swedish): https://www.havochvatten.se/hav/samordning--fakta/havsplanering.html.

2. THE CENTRAL BALTIC CASE STUDY APPROACH

The Central Baltic case study was led by the Ministry of Environmental Protection and Regional Development of the Republic of Latvia, in close cooperation with the Estonian Ministry of Finance and SwAM. The main driver and information turntable in the case study work has been the Planners' Group, a working group consisting of maritime planners from the partner authorities, who met repeatedly between March 2015 and January 2017 in different constellations. The group closely collaborated with experts from Nordregio, HELCOM, SYKE and VASAB. The work of the Planners' Group was complemented through sector experts in thematic groups and a special topical Ecosystem Approach Task Force. The Central Baltic case had an emphasis on actively involving sector stakeholders outside the project, as described in more detail below.

2.1. THE CENTRAL BALTIC CASE STUDY AS PART OF THE OVERALL BALTIC SCOPE PROJECT

Work in the project was divided into four main activity phases over a period of six months: a preparatory phase, an identification phase, a solution phase and a conclusion phase. The overall project method included a number of meetings in different constellations:

1. **Partner meetings:** involved all or most partners, planners from case study areas, communication (VASAB), administration and research organizations (HELCOM, SYKE and Nordregio).
2. **Planners' meetings:** primarily engaged planners. Organized separately within each case-study area, these working-meetings were attended and partially facilitated by research organisations.
3. **Thematic meetings:** entailed expert groups from the four marine use sectors that Baltic SCOPE focused on (environment, energy, fisheries and shipping); detailed evidence and sector needs for integration into MSP were discussed and transboundary and cross-sector aspects addressed.
4. **The Stakeholder Conference:** particularly involved institutional stakeholders in the focus sectors in order to provide input.
5. **The 2nd Baltic MSP Forum:** organized by VASAB and Baltic SCOPE in cooperation with The International Council for the Exploration of the Sea (ICES) and aimed at bringing together practitioners, policy-makers, researchers and other interested people involved in marine and coastal activities. The MSP Forum attracted approximately 250 people to diverse panel discussions, seminars, workshops, and networking activities. The Baltic SCOPE project exhibited its preliminary results through several interactive workshops and collected final input for the ongoing work.[6]

Because planning issues and status differed between countries and marine basins, project work was divided into two case study areas, where the planners were working in parallel, with differing perspectives and methods: a) the Central Baltic case covering the territorial waters and EEZ comprised between Estonia, Latvia and Sweden (reported here) and b) the South West Baltic case encompassing the sea between Germany, Denmark, Sweden and Poland. The two cases interacted during the partner meetings. If possible, planners' meetings were organised back to back.

6 For summaries, see: http://www.balticscope.eu/events/baltic-2nd-msp-forum/

Based on their situation analysis, the Planners' Group of the Central Baltic case study adopted a topic-focused and procedural approach for the whole geographic area including intensive interaction with stakeholders (Box 2.1-1). Important aims were to reach conclusions and joint recommendations on how to identify and harmonise knowledge and define and address transboundary MSP issues across the sea and in the respective national planning processes. The group chose a topical approach and examined issues in the sector/topic areas of shipping, energy, fisheries and environment. These four sectors were seen as most important to consider for promoting coherence in transboundary MSP in the Central Baltic case study and in the Baltic SCOPE project in general. They had been selected early in the project, based on an identification of important uses and building on results from previous MSP projects in the Baltic Sea Region[7]. From a longer list including e.g. dumping, defence, tourism and recreation, the above four areas were seen as most relevant for transboundary planning, while the others were deemed to be of more national and coastal character.

BOX 2.1-1: MAIN CHARACTERISTICS OF THE CENTRAL BALTIC CASE STUDY APPROACH

Situation: A relatively strong sector division in terms of management and so far little knowledge on potential areas of conflict or synergy between sectors in the study area.

Overall Baltic SCOPE goals to be applied in the Central Baltic area: To develop basic knowledge and transform it into evidence appropriate for MSP and to identify and develop transnational solutions of cross-sector conflicts. To use synergies between sectors in an effective way and to interact with relevant sector stakeholders.

Identified needs:

- To overcome sector fragmentation;
- To develop a more reliable transnational knowledge base for MSP in the Central Baltic area and discuss data availability and harmonization;
- To interactively share knowledge with sector stakeholders to promote cross-sector understanding and thinking in terms of MSP and a possible development of transnational solutions.

Approach chosen:

- Stepwise;
- Topical;
- Process-based;
- Recurrent involvement of stakeholders both from a sector and a cross sector perspective;
- Repeated interaction with the other area case study and overall project.

7 Such as the chain of Baltic Interreg-funded MSP Projects of Balt Coast, BaltSeaPlan and PartiSEApate including similar actor constellations and located more in the Southern Baltic, but also others such as BALANCE and Plan Bothnia.

Baltic SCOPE as such, and the method chosen by the Central Baltic case study group, implied a complex type of analysis and synthesis of different knowledge and continuous interaction not just with the overall project, but also within the case study, i.e. among the leading Planners' Group, topical sub-groups, the EBA-Task Force and with further stakeholders outside the project through several forums. The interactions between different groups and forums are illustrated in Fig. 2.1-1.

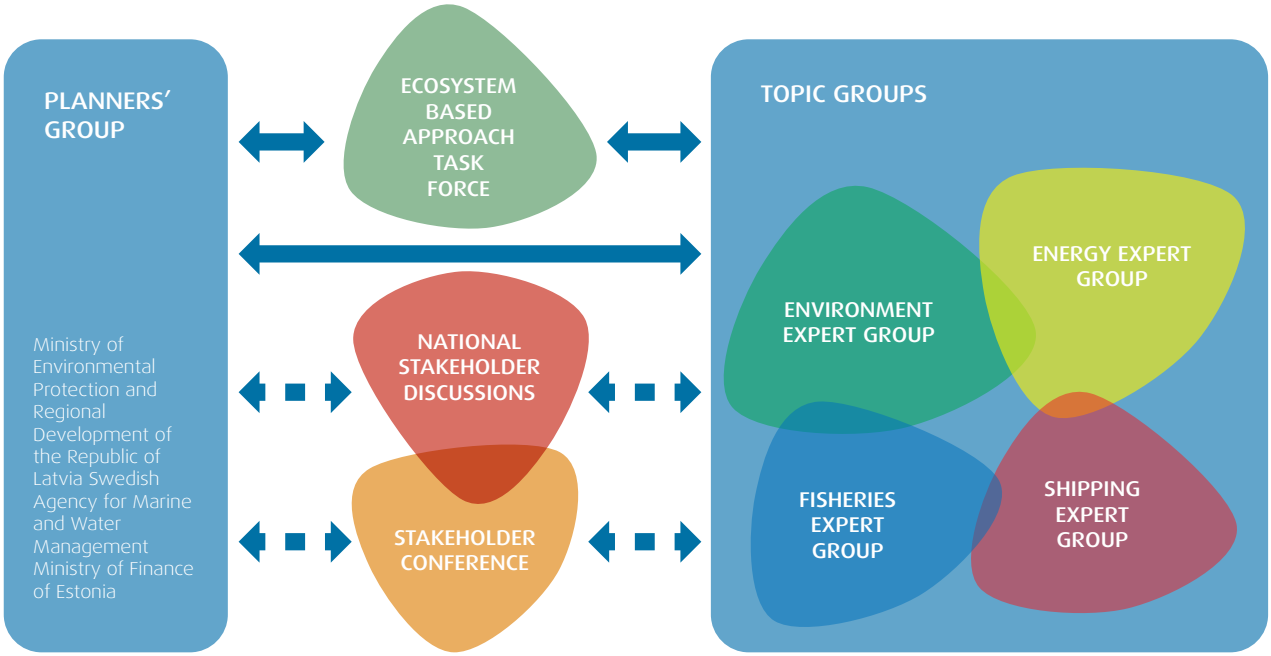


Figure 2.1-1: Overview of the Central Baltic case study approach.

The figure shows different working groups and forums, their interactions and mutual input. Planners, the task force and national sector experts interacted most intensively. Complementary input was sought from the Southwest Baltic case study and stakeholders outside this administration and Baltic SCOPE (Source: Ministry of Environmental Protection and Regional Development of the Republic of Latvia).

2.2. STAKEHOLDER INVOLVEMENT IN THE CENTRAL BALTIC CASE STUDY

As essential part of the overall Baltic SCOPE process, project partners tried to engage relevant institutional and other stakeholders[8] in a cross-border and cross-sector discussion on planning the Baltic Sea. The purpose of stakeholder involvement was to initiate a cross-sector and cross-border dialogue between planners and representatives of different use interests. The Central Baltic case study placed a strong emphasis on both expert knowledge and on stakeholder interaction by involving sector authorities and some non-governmental stakeholders in project activities. Stakeholder involvement took place at a national level through workshops and two Thematic Meetings, and on a transnational level through a Stakeholder Conference focusing on transboundary issues. Through their inclusion in the work of four topic groups during the identification phase, sector stakeholders had direct influence on the drafting of topic papers that became the basis of the case study work. The participating stakeholders were mostly representatives from relevant authorities, i.e. planners and sector experts (including researchers), and in some cases, enterprises and NGOs (e.g. handling ports, energy, conservation). The transnational process involved mostly institutional stakeholders.[9] The stakeholder events took place in Estonia and Latvia, yet there was an uneven participation from the three countries. Despite encouragement by SwAM, very

8 From the start, Baltic SCOPE had the clear intention to work mainly with "institutions" (as its first necessary focus) and less with other types of civil society stakeholders (e.g. enterprises, NGOs etc.). However, during national stakeholder events, in some cases, enterprises (e.g. from the energy sector) and non-governmental organisations participated as well. For the transboundary event the stakeholders invited were mostly relevant authorities, planners and experts from various sectors.

9 The report does not include a deeper stakeholder analysis for each country and sector. This was beyond the scope of the project and is country specific; it has been done in the national planning processes, when this stage was reached.

few Swedish stakeholders attended the thematic meetings and the Stakeholder Conference. Stakeholder involvement in ongoing national MSP was to some extent linked to Baltic SCOPE and during the project was as follows:

Estonia:

Estonia carried out stakeholder involvement by focusing on the energy, environment, fisheries and transport sectors. Three stakeholder meetings were carried out in autumn of 2015, with some 15 to 20 participants in every event. The aim of these meetings was to gather input for the elaboration of national topic papers for each sector as well as to promote MSP, not only the official process, but also as a tool for decision makers. The first meeting had a sector approach, so that stakeholders could discuss the current conditions and future trends and needs of each sector. Afterwards, two cross-sector meetings were organized with an opportunity to discuss existing and potential conflicts between the interests of different sectors and to identify possible synergies between them. Besides the national issues, the meetings also dedicated some time to discussing transboundary issues. More specifically, the goals and objectives of neighbouring countries were analysed to identify possible areas of cooperation. Participants were also asked to reflect on the added value of sharing the marine space. The stakeholders involved were state institutions (ministries, agencies), NGOs, private entities, and associations.

Latvia:

Stakeholders have been relatively actively involved in the development of MSP-related regulation and MSP itself since 2010, therefore, mobilizing stakeholders and encouraging active participation in the latest round of national planning meetings was relatively straight forward. At a national level, between 2015 and 2016, stakeholder involvement took place through a number of sector (18 meetings) and cross-sector meetings (6 meetings); citizen participation was also encouraged in public hearing events (5 hearings). Stakeholder groups were well represented and included governmental bodies, civil society groups and representatives from the private sector. The focus of the meetings differed; the first phase would set the scope of sector interests and discuss development directions, with the second phase examining scenarios and the third phase discussing and agreeing upon potential solutions for national and cross border issues. With the launch of Baltic SCOPE, cross-border issues were added to the discussion so that both national and transnational challenges would inform the discussion across all levels of governance. Within individual sector meetings, stakeholders outlined development interests, strategic objectives and demands for the sea space.

Sweden:

Stakeholder involvement already began in 2012 before this project for a number of different purposes (e.g. regarding data on current status, trends, planning objectives), but it intensified in 2016 with concrete work with data and maps through a series of thematic group meetings with mainly national institutional stakeholders aimed at mobilising authority stakeholders within Sweden, providing information, and gathering input from participants. Mostly national authorities were invited, including county administrative boards, plus representatives from county councils and local authorities. The meetings primarily focused on national planning issues, but also on cross-border issues when appropriate, and provided a sector perspective with the aim of showing possible conflicts and synergies between sectors with a broader perspective than the four Baltic SCOPE sectors. This included a systematic cross-sector conflict and synergy analysis in marine space. The information from these meetings was also brought forward as planning evidence within Baltic SCOPE. These maps and findings were, as part of the national process, presented to a general public in a national stakeholder meeting, which also involved non-authority stakeholders.

2.3. IMPORTANT STEPS AND METHODS USED IN CENTRAL BALTIC CASE STUDY WORK

Important steps from the Central Baltic case study work are described below in relation to the Baltic SCOPE activity phases (preparatory, identification, solution and conclusion) including links to the report's chapters (for an overview, see Box 2.3-1 and Fig 2.3-1).

BOX 2.3-1 TIMELINE OF CENTRAL BALTIC CASE METHODOLOGY, EVENTS AND OUTPUTS

1. Preparatory phase

- 4 Planners' Group meetings including a kick-off event: Choice of topics to work with and definition of case study work outlined by planning experts.
- National topical consultations with stakeholders (autumn 2015).
- 1st thematic meeting in Riga (December 2015): sector experts and stakeholders discussed topical matters.

2. Identification phase

- 1st drafts of topic papers and first attempts to compile sector maps. Interaction with stakeholders to get feedback on assembled material.
- 2nd thematic meeting in Tallinn (February 2016): sector experts discussed interactions and developed interaction tables. The World-Café method in mixed groups was used to extract the most relevant conflicts and synergies.
- Compilation of conflict and synergy tables after the meeting (Nordregio).
  Compilation of final versions of topic papers (topic experts).
  Compilation of overall and cross-sector interaction maps (GIS-experts).

3. Solution phase

- Jūrmala Stakeholder Conference (16 June, 2016): The overall map and specific cross-sector interaction maps (e.g. environment-shipping) were presented to stakeholders to encourage thinking across sectors, spatially and in relation to MSP.
- Topic experts compiled sector observations and recommendations. Case leaders created a compilation/table of overall conflicts and synergies.
- The Copenhagen planners meeting (September, 2016): Discussed matrix, report structure, recommendations and what to include in the overall project recommendations.

4. Conclusion phase

- Compilation of an overall report draft according to both the sector and cross sector perspective by planners with maps and figures.
- The 2nd MSP Forum (November 2016): Discussed tentative conclusions and recommendations with fellow planners from other countries and stakeholders in several sessions.
- Planners meeting, Stockholm (December 2016): Brainstorming and reflection of Central Baltic experts on an overall map and the Conflict and Synergy Table regarding content and process of development.
- Processing by planners through report writing: going from a sector/country perspective to a cross-sector chapter perspective.
- Parallel synthesis work and discussion of overall recommendations by the project.

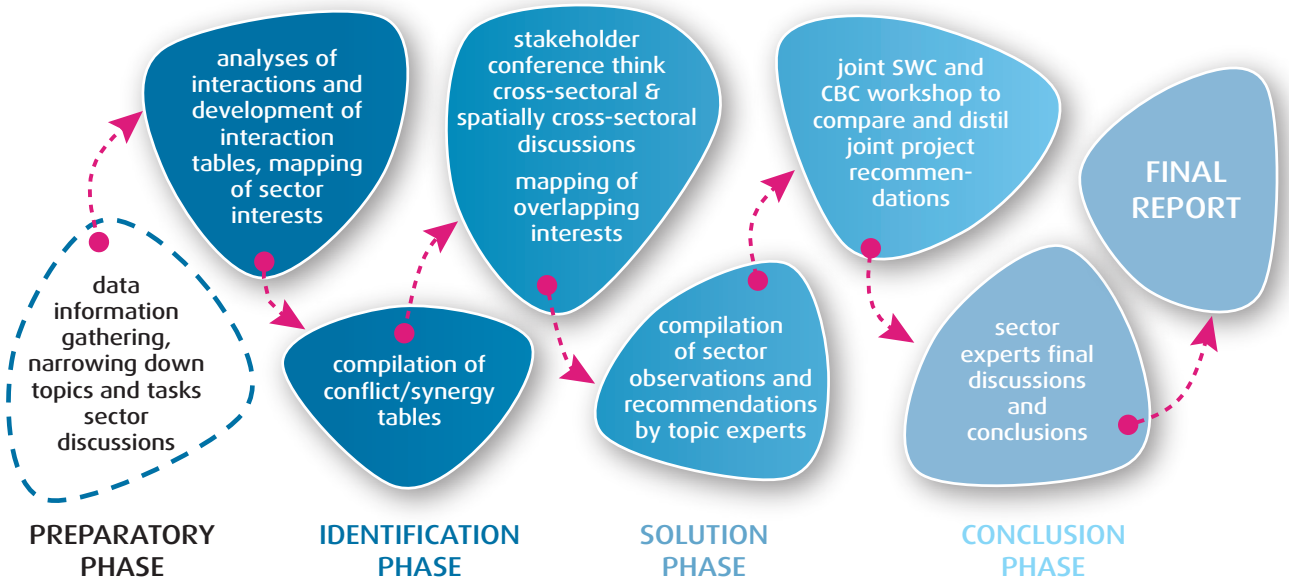


Figure 2.3-1: Working steps in the Central Baltic case study in relation to the overall project
(Source: Ministry of Environmental Protection and Regional Development of the Republic of Latvia).

More specifically, the Central Baltic worked with the subsequent process and important methods:

1. Preparatory Phase (Months 1-6): identifying Topics and Tasks

The Central Baltic Planners' Group formulated collaboration tasks and adopted a work approach for the project. The Planners' Group decided to develop transboundary cooperation through thematic working groups on four topics: Energy, Environment, Fisheries and Shipping with respective national experts in each, working in parallel to the Planners' Group activities. The groups on energy and environment were both led by Latvian experts, the fisheries group by a Swedish expert and the shipping group by an Estonian expert. Thematic working groups' leaders were assigned the task to elaborate topic papers (see below). Moreover, an Ecosystem Based Approach Task Force was created to work with the implementation of an ecosystem-based approach in MSP (see Box 2.3-2).

BOX 2.3-2 A BALTIC SCOPE ECOSYSTEM BASED APPROACH TO MARITIME SPATIAL PLANNING

Ecosystem-based approaches have in the last years been developed in various contexts, promoted not the least by the Convention on Biological Diversity and the related Malawi principles 1998[1]. Today, ecosystem based management is widely accepted and integrated in marine policy, including the EU's Marine Strategy Framework- and Maritime Spatial Planning directives. For the Baltic, the HELCOM-VASAB MSP-Working Group has presented a "Guideline for the implementation of an ecosystem-based approach in Maritime Spatial Planning (MSP) in the Baltic Sea area".[2] This guideline, including both key elements for an ecosystem-based approach and parameters for Strategic Environmental Assessment, are to provide a basis to implement an ecosystem-based approach in MSP in the Baltic Sea region.

An important initiative, emerging from the Central Baltic case study, has been the Ecosystem-Based Approach (EBA) Task Force. It was led by Sweden with the task to work on integrating an ecosystem-based approach in project activities. One aim of Baltic SCOPE was to provide practical input on how an ecosystem-based approach could be implemented in MSP. Task Force work should promote a more harmonized understanding of what an ecosystem-based approach implies and how it could be practically implemented in MSP. The EBA Task Force used the above HELCOM-VASAB ecosystem approach guidelines, thematic workshop results, and SEA-experiences as its basis and developed three checklists (see below) that ensure that all elements of an ecosystem-based approach are included in the MSP process. The toolbox was developed and tested in the Central Baltic and eventually extended to be applicable also for countries in the Southwest Baltic case study area.

Baltic SCOPE Ecosystem-Based Approach Guiding Paper and Checklists

The report (Schmidtbauer Crona et al. 2017) summarises the approach taken and includes the following three different checklists to be used at various stages of MSP:

1. The Overall Ecosystem-based Approach Checklist with the aim for all key elements of the ecosystem approach (based on the HELCOM/VASAB-guideline) to be included in the MSP-process layout and organisation.

2. The Planning Support Checklist with the aim to proactively contribute to the implementation of the ecosystem-based approach in actual planning related to the shipping, fisheries and energy sectors.

3. The SEA checklist with the aim to contribute to harmonized SEA application in MSP, which adds to implementing the ecosystem-based approach and considering both the SEA- and the Marine Strategy Framework directives.

Baltic SCOPE final recommendation[3] states that planning authorities should take into consideration the three ecosystem-based approach checklists when drafting/revising national plans, a recommendation shared by the Central Baltic case study planners group.

The resulting report and findings, including EBA checklists, provide input to good practice likely to be relevant beyond the project and the Baltic sea area.

For the full report (Schmidtbauer Crona et al. 2017) including checklists, see www.balticscope.eu.

1 Homepage of CBD on the Ecosystem Approach: https://www.cbd.int/ecosystem/default.shtml
Malawi Principles for the Ecosystem Approach: http://www.fao.org/docrep/006/y4773e/y4773e0e.htm
Important for implementation – Kuala Lumpur decisions:
https://www.cbd.int/doc/decisions/cop-07/cop-07-dec-11-en.pdf

2 For the HELCOM-VASAB related work and documents, see:
http://www.vasab.org/index.php/maritime-spatial-planning/msp-wg
http://helcom.fi/news/Pages/New-Guideline-adopted-on-ecosystem-based-approach-in-maritime-spatial-planning-in-the-Baltic-Sea.aspx

3 The report Recommendations on Maritime Spatial Planning Across Borders containing general and sector specific recommendations is available online at www.balticscope.eu.

2. Identification Phase (Months 7-12): From Sector to Cross-sector Analysis

After recurrent feedback and information exchange between the four topical groups and the Planners' Group it became clear that there were no specific "hotspots" within the case study area during that time (e.g. existing geographic areas with potential cross-border conflicts). The planners decided to work at an overall Central Baltic level with a focus on topics and processes (without geographic in-depth studies such as in the South West Baltic case study), to develop a joint map of conflicts and synergies, and to find planning criteria to promote harmonised MSP solutions between countries.

The planners began to consult with sector stakeholders by inviting institutional and other sector experts both nationally and for the whole case study area. First, the MSP authorities conducted national discussions with sector institutions and experts on priorities for each sector. Then, at the 1st Thematic Meeting between all countries discussions occurred in topic-based groups between planners and thematic experts (i.e. environment, energy, shipping and fisheries) with the aim to identify all sector interests to consider in MSP. Here, the national priorities of each sector and its role in the MSP process were distilled. The outcomes of these discussions were incorporated into four topic papers (Box 2.3-3); these were gradually refined and used as background during the remaining project, including the present report.

BOX 2.3-3 TOPIC PAPERS AS AN ENCOMPASSING SECTOR KNOWLEDGE BASE

Both case studies elaborated the so-called sector or Topic Papers.[1] Each case study elaborated four topic papers, one for each of the sectors identified as being key in transboundary MSP (environment, energy, fisheries, shipping). Although the topic papers were led by one partner country, they included all the partners' perspectives. This effort effectively contributed to an understanding of each sector's spatial needs and requirements in relation to MSP and developed the understanding of transboundary issues in each sector. These papers provided a strong knowledge base for both transboundary and cross-sector stakeholder discussions.

1 For the final versions of the topic papers produced by the CBC, see Āboltiņš et al. (2016), Aps et al. (2016), Kopti et al. (2016) and Ruskule et al. (2016). http://www.balticscope.eu/events/topic-papers/ .

The 2nd Thematic Meeting implied cross-sector analysis and discussions, using the World Café method (Box 2.3-4). The participants were primarily project partners and related sector experts or consultants appointed by the authorities. This resulted in a mapping of cross-sector interrelations, including existing and potential conflicts and synergies between sectors. These results were assembled and synthesized by Nordregio in a cross-sector conflict and synergy working paper, which was then sent out to the project partners for checking and establishing their use in future stakeholder interaction. A lot of identified possible conflicts and synergies showed to be merely national, only those of transboundary character were chosen for further discussions. It may be somewhat difficult for sector experts to distinguish between planning relevant issues and pure management issues, which was to some extent reflected in the results from the World Café sessions.

BOX 2.3-4 WORLD CAFÉ AND CONFLICT AND SYNERGY TABLES FOR CROSS SECTOR ANALYSIS

The **World Café method** is described by its founders as "a powerful social technology for engaging people in conversations that matter". According to Steyaert and Lisoir (2005) participants are to "discuss a question or issue in small groups around the café tables. At regular intervals the participants move to a new table. One table host remains and summarises the previous conversation to the new table guests. Thus the proceeding conversations are cross-fertilised with the ideas generated in former conversations with other participants. At the end of the process the main ideas are summarised in a plenary session and follow-up possibilities are discussed." For Baltic SCOPE the method was adapted to facilitate cross-sector discussions for the second thematic meeting with stakeholders. Here expert groups worked in a round of pair conversations, where each group got to meet all the other groups. During each of these short meetings every expert group shared the key aspects that need to be considered for their sector in MSP. This exercise enabled the whole group to see the bigger picture and in a next step identify possible synergies and existing/potential conflicts between the sectors and even discuss potential solutions ahead of time regarding the identified conflicts.

Conflict and Synergy Tables: The information was assembled by Nordregio in a short paper and table, which distinguished between the conflicts and synergies of each pair of sectors and classified them according to two dimensions: cross-border/cross-sector ⇔ cross-border/single sector and national/cross-sector ⇔ national/single sector. The resulting matrix provided an overview of the scope of interests involved as well as potential conflicts in specific topic areas.

3. Solution Phase (Months 13-18) – Mapping Exercises and Deepened Analysis

The topic groups discussed spatial priorities at sea for each sector and how these and other relevant planning evidence could be presented. This included a joint Mapping Exercise, starting with shipping and then expanding to environment and Green Infrastructure and beyond. This task, not entirely as easy and straightforward as expected, implied a substantial amount of work and has resulted in pioneering transboundary maps on the Central Baltic, which, however, still cannot be considered as proper planning evidence. For results and reflections on planning evidence, see chapter 5. Further work resulted in four final versions of substantial Central Baltic topic papers[10], which reviewed the sector status and trends, planning systems, provided existing evidence and challenges, as well as presented proposals on how to address them. These were reviewed nationally with stakeholders. Updated results were brought back to the Planners' Group, which decided on a "cross-sector interactive" and "public" approach.

The next step and an important event was the Stakeholder Conference, held in Jūrmala in June 2016, with the aim of gathering as many MSP stakeholders from the three countries as possible in order to gain feedback on proposed solutions to conflicts and potential synergies and draft recommendations developed by the sector experts and planners. Here, feedback was collected on what the sectors considered to be feasible or not. The four topic papers were finalized and sent to the participants beforehand, for preparation and to provide background information. The conference was structured in two sessions, where Baltic SCOPE planners, experts and external stakeholders from all three countries worked in both sector and mixed groups. They engaged in facilitated discussions to evaluate the potential conflicts and synergies previously identified by the expert groups. The first session focused on sectors with parallel groups for shipping, energy, environment and fisheries. Here, the stakeholders were introduced to earlier sector discussions and the outcomes from the thematic meetings.

The second session was organized in four mixed groups, each group comprising stakeholders

10 See Āboltiņš et al. (2016), Aps et al. (2016), Kopti et al. (2016) and Ruskule et al. (2016). http://www.balticscope.eu/events/topic-papers/

from all four sectors. To illustrate possible interactions between sectors and to facilitate sector and border crossing discussions between experts and stakeholders, the working paper on conflicts and synergies and a newly compiled overall map (see chapter 6, Fig. 6-1) were used. The map included all sector data, gathered and discussed during the thematic meetings, illustrating the best available information on each sector's claims for sea space. Each group focused on one sector and its interactions with the others and defined the three most important conflicts and synergies. For more details on the analysis of cross-sector interaction, including the process in developing the maps, see chapter 6.

Important results were also planners' and stakeholders' reflections on how to understand each other and MSP as such. The comments collected indicate that mutual understanding is under way, but that there is still work to do. The main points follow here: From the planners' perspective, the sectors are rather self-sufficient, making it difficult to get sector stakeholders to understand what MSP is about and what is needed to include them into MSP. Planners also consider the sectors to have difficulties in understanding the MSP perspective because time frames differ and sectors often lack long-term visions (sector policies usually cover 7-10 years, whereas MSP is decade-minded). The sector representatives (experts, user representatives) in their turn are afraid that MSP is diminishing their competence. They also feel that planning simplifies their sectors (e.g. shipping) and that marine planners do not understand their sector needs.

As mentioned, participation varied between countries, as the conference was held in Latvia, proportionally more Latvian and Estonian stakeholders participated. Nevertheless, as there are presently no serious transboundary conflicts, the expertise represented was deemed broad enough to discuss possible cross-sector synergies.

4. Conclusion Phase (Months 19-24): Synthesis, Challenges and Recommendations

The synthesis of the Jūrmala Stakeholder Conference outcomes can be divided into two types and was processed further into two parallel tracks – both at a case study and project level.

1. The conflicts and synergies identified in Jūrmala were processed further by the planners, led by the Latvian team, who also developed an overall synthesis table, which is included in this report (see chapter 6, Table 6-1). It summarises the most important conflicts and synergies, providing a first basis in advancing the development of cross-border cooperation.
2. The topic groups refined the challenges for cross-border cooperation and prepared papers identifying important observations, challenges and recommendations for each sector as well as general recommendations for transboundary MSP (see chapter 7 and project recommendations).

At the Copenhagen project and planner's meeting (September 2016), the planners condensed the above topic challenges and recommendations into case study specific conclusions, classifying particular points as more general deductions for the overall project. These were then processed and summarized in the overall group, with a further selection made through web-based voting (see final recommendations report).[11] The planners also discussed the overall structure for the present final report (Box 2.3-5), integrating topic papers, and identifying cross sector interaction, challenges and recommendations into one comprehensive report, assisted by Nordregio as the editor. Subsequently, work proceeded in several steps: assembling and filling in gaps; trying to extract and synthesise overall conclusions and lessons learned. This was accomplished by a repeated peer review process within the group through text processing and facilitated discussion in both direct interaction and distance meetings. In a brainstorming session in Stockholm (13 December, 2016) and through the writing of the final report, the planning experts reflected further on cross cutting issues and the report, the methods used and the other outputs from the Stakeholder Conference.

11 The report Recommendations on maritime spatial planning across borders containing general and sectoral recommendations is available online at www.balticscope.eu.

BOX 2.3-5 FINAL REPORT: METHODS USED FOR THE DIFFERENT CHAPTERS

The report chapters have been developed out of the process described above. They sequentially follow the working process of the working group, but using slightly different methods and sources.

Chapter 3 summarises the status and trends in the four sectors based on the topic papers.

Chapter 4 summarises institutional frameworks based on the work of the topical expert groups through the topic papers, further complemented by the planning experts. Additional details from the analysis can be found in the specific topic papers.

Chapter 5 summarises the mapping exercise and presents the first maps ever produced of all four sectors in the case study area. It also describes the sources and methods used and the process assembling existing evidence in more detail. This differed considerably between sectors.

Chapter 6 is based on the mapping exercise and the cross-sector analysis through topic meetings and the Stakeholder Conference; it is complemented by further work done by the leading partner, which produced a comprehensive cross-sector map and conflict and synergy table. It includes further reflections on how well synthesizing worked and was further developed during a Planners' meeting in Stockholm (December 2016).

Chapter 7 features challenges and recommendations as a result of all the earlier working steps and is heavily based on the thematic challenge and recommendation papers, which were drawn together during the last two Planners' Group meetings (December 2016 & January 2017) and the final writing phase.

An important challenge has been to mobilise all relevant stakeholders. At any rate, those participating provided valuable input. Challenges of the final synthesis phase have been: a) to condense complex matters and processes and make them easier to understand; b) to think systematically across sectors and identify overall conclusions; c) to grasp the silent knowledge of the process beyond available maps and sector-based text and record reflections and learning made during this proces – while at the same time d) working and delivering in national planning processes.

Summing up, a number of different methods (for an overview, see Box 2.3-6) have been used to drive the project work and integrate it among sector perspectives and cases: methods for analysis from a sector and cross-sector perspective, and methods to communicate between planners and sectors, as well as methods for synthesis within the case study, and integrate across the whole project. This overview might both provide an understanding of how the project worked but also inspire others in the same endeavour to develop MSP in their respective marine basins.

BOX 2.3-6 OVERVIEW: METHODS USED IN THE CENTRAL BALTIC CASE STUDY

Step-wise Case Work

Analysis and knowledge gathering for planning evidence:

- Topic papers
- Topic maps
- Cross-sector maps (bi-lateral)
- A combined map (overall)

Interaction:

- Planners' meetings
- Thematic meetings
- World Café, for cross-sector interaction mapping
- The Stakeholder Conference
- A Workshop Session at the 2nd MSP Forum in Riga
- Synthesis across sectors:
- Cross-sector conflict and synergy tables
- Overall conflict and synergy table
- Challenges and recommendations papers
- Final report writing

Cross-cutting Work

Project activities

- Planners and project meetings to discuss and interact across cases and groups
- Outreach events like Riga Kick-off and the 2nd MSP Forum in Riga

Pan-Baltic work within the project

- Ecosystem-Based Approach Task Force
- Joint green map for the Central Baltic area based on Swedish experience (chapter 5)
- Shipping density maps based on AIS-data developing out of the mapping exercise (chapter 5; by HELCOM)
- Assessment reports summarising knowledge during the preparatory and identification phases, including conflict and synergy tables for both case studies and a project recommendations report based on interactive discussions and the project's internal survey (Nordregio)

Overall, from the perspective of the Planners' Group, the Central Baltic approach ensured meaningful links between Baltic SCOPE and on-going and emerging national planning processes. The findings have already been integrated into national MSP. Estonia has used conclusions from the project to prepare terms of reference for its national Maritime Spatial Planning. In turn, Latvia planned simultaneously with Baltic SCOPE: a first draft of a national marine spatial plan was presented in mid-2016 and conclusions and accumulated knowledge will be integrated in the final version of the plan. Also Sweden has been preparing first drafts of national plans parallel with Baltic SCOPE. The Central Baltic case study approach also ensured in-depth cross-border sector discussions on sector priorities and the role of sectors in MSP. All in all, Baltic SCOPE implied a unique opportunity for the three countries sharing a common sea to collaborate in a period when national stakeholders were actively engaged in actual national planning.

3. CURRENT STATUS AND TRENDS IN FOUR MARITIME SECTORS IN THE CENTRAL BALTIC

An important first step for the Central Baltic experts, but also for planning in general, was to analyse what different sectors are doing, which spatial needs they have and how they are expected to develop in the future. When trying to collect and assemble existing knowledge on uses of the Central Baltic Sea, it became clear that there is a lack of consistent transboundary data and available knowledge has not always been easy to assemble.

This chapter provides an overview on the current status and trends in four important marine interest sectors that MSP has to address:

1. **Environment:** is not a maritime use sector, but rather a sector of institutional responsibility. Focus is on the most important environmental features, values and overall problems and pressures relevant for transboundary MSP.
2. **Energy:** the analysis includes both production and distribution of energy with a focus on the increasing importance of renewables.
3. **Fisheries:** the focus here is on commercial fisheries and only to some extent on coastal fisheries and related harbours. Aquaculture is not included, as it is of less relevance in the EEZ where project focus has been.
4. **Shipping (maritime transport):** analysis here is on larger scale transport of goods, vehicles and persons, including a perspective on ports and harbours, but excluding coastal and recreational traffic.

Each sector or topic section first describes general traits for the Central Baltic as a whole, before presenting important traits in the Central Baltic countries of Estonia, Latvia, and Sweden. For further information on each sector, we refer to the respective topic papers.[12] Moreover, it includes the first compiled maps visualizing existing sector data from the three countries in Chapter 5 Planning Evidence, as far as they can be assembled at the present stage. An overall map with a cross-sector overview, as far as this is presently possible can be found in Chapter 6.

Table 3-1 summarizes the main conclusions on status, trends and MSP implications for each sector. An in-depth discussion will follow in subsequent sections.

12 See Āboltiņš et al. (2016), Aps et al. (2016), Kopti et al. (2016) and Ruskule et al. (2016).

Table 3-1: Overview of the Sector Status and Trends in the Central Baltic and the Implications for MSP

Sector	ENVIRONMENT	ENERGY	FISHERIES	SHIPPING
Status	Eutrophication is the main environmental problem in the whole Baltic Sea including the Central Baltic (CB) area. Status of benthic habitats varies from stable to low. Quality and distribution of habitats is decreasing due to eutrophication, mechanic destruction or invasive species. Existing knowledge gaps on overall status and distribution of ecologically valuable areas in the CB. Insufficient coherence of MPA network. The EU-MSFD target of Good Environmental Status (GES) has not been achieved.	*Interconnections (onshore and marine):* Current interconnections are satisfactory but need to be improved. *Renewable energy production incl. Offshore Wind (OSW):* Marine renewables are still at a minimal stage of development in the CB area.	Widespread, diverse and temporally varying use of the Baltic Sea with spatial claims for both fishing grounds and routes to landing ports. CB partners differ in their view on Essential Fish Habitats (EFH) and related threshold levels of depth.	The CB is mainly a transit area for international shipping, but of national importance for economic development. The intermodal quality of harbours affects the sectors' spatial patterns at sea. It is a key factor to sustain and develop the role in both international trade and national transportation. Safe and efficient passages are the main factors affecting the spatial claims of shipping routes. In the highly sensitive Baltic Sea this needs to be balanced with environmentally friendly implementation and maintenance of routes. Energy development at sea affects the safety for shipping.
Important Trends	Continued high level of eutrophication in spite of decreasing nutrient loads. Risk of degradation of bentic habitats and ecologically valuable areas due to increasing human pressure. The area covered by MPAs is expected to increase (new MPAs shall be developed in the EEZ of EE, LV and SE). Climate change is a major factor influencing the future of the Baltic Sea ecosystem.	*Interconnections (terrestrial and marine):* Improved and additional interconnections are essential for further integration of the EU internal energy market and for increasing energy security of EU member states and the Baltic Sea region. *Renewable energy production:* EU emission trade system, CO2 policy and prices will directly impact the dynamics of the expansion of renewables, including and in particular of OSW technologies.	Rationalisation of fishing fleet. Development of gear and fishing methods to promote sustainability. Uncertainty regarding future spatial conditions of fish habitats.	Vessels grow longer and wider but face depth limits in Danish straits at the gates to the Baltic Sea. Increasing offshore energy development will enhance demands on safety aspects and competition for available sea space. Increased automatized navigation and Sea Traffic Management are tools in the development of efficient and safe shipping.
Implications for including the sector in MSP	The effects of euthrophication need to be considered in MSP when allocating sea space for activities implying additional pressure or risk of nutrient inputs. Status of the benthic habitats can be directly influenced by sea use activities and MSP. Habitat mapping and quality assessment, sensitivity assessment to different sea uses and estimation of the level and scale of the expected impact are essential preconditions for development of MSP solutions. Mapping of areas of high ecological value is an essential precondition in implementing the ecosystem based approach in MSP.	*Interconnections (terrestrial and marine):* Additional interconnections imply the need for space even though it is relatively limited for linear infrastructure, but still it can be potentially conflicting if overlaid with other marine uses in specific areas. *Renewable energy production:* Increase of favourable conditions (CO2 price and energy market) will strengthen claim for space and intensify competition between existing, expanding and new marine uses.	Several spatial characteristics such as resources and harvests - are the main objectives (both are transboundary by nature.) Management put demand on multiple approaches in MSP.	MSP should ensure safety at sea and navigation requirements in the light of new activities in marine areas and trends in the shipping sector. The interplay between shipping, and road and rail transportation needs to be recognized and improved. This calls for efficient planning on land and at sea in a consistent and mutual dialogue. Nationally planned permanent structures i.e. OSW might impact transboundary shipping routes.

3.1. STATUS, PRESSURES AND TRENDS IN THE CENTRAL BALTIC MARINE ENVIRONMENT RELEVANT FOR MSP

The current status of the marine environment in the Central Baltic area is characterized by various deficiencies in the structure and functioning of the ecosystems, and that most of the criteria and indicators set by the MSFD for GES are not fulfilled. Identified deficiencies include: threatened fish species with small or decreasing populations, shrinking or affected marine habitats and excessively low oxygen levels due to eutrophication.

The Baltic Sea region has a sensitive marine ecosystem with a low number of dominating species compared to other marine areas. Its shallow waters and the slow water exchange with the North Sea, also makes it particularly sensitive to human pressure. However, human uses (see sections 3.2-4) put increasing pressure on the functioning of marine ecosystems, not least through nutrients from land based activities, selective fishing or overfishing, the introduction of invasive species, pollution by marine litter and hazardous substances, and the physical destruction of seabed habitats. Important impact mechanisms related to the above pressures are specified below.

Eutrophication: The most significant pressure on the marine environment is eutrophication, mainly related to land-based run-off from agriculture (ca. 75% of nitrogen and 95% phosphorous loads brought by rivers; Ruskule et al 2009). Further sources of nutrients are forestry, industrial and municipal wastewaters, as well as emissions from combustion (motors and heating). Eutrophication leads to increased phytoplankton production and growth of filamentous algae in coastal waters as well as large areas with oxygen deficit or complete anoxia, which makes bottom habitats uninhabitable for many species (Fig. 3.1-1). MSP has a limited mandate to reduce eutrophication, but should take into account its negative impacts on the marine environment from a cumulative perspective, which relates to MPA and the protection of marine green infrastructure in MSP.

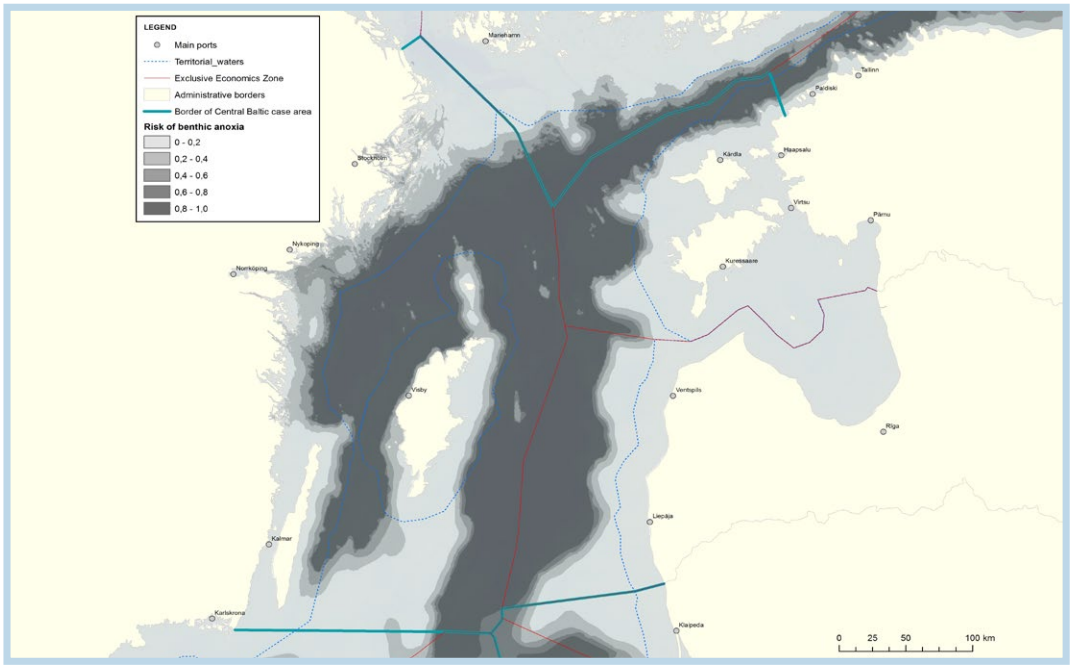


Figure 3.1-1: Risk for benthic anoxia in the Central Baltic study area (Baltic SCOPE 2016).

Fisheries: While overfishing is addressed by international quota agreements and increased control, selective removal of fish species still affects not only the size and condition of fish populations, but also food webs and the overall functioning of the marine ecosystem. MSP could address regional or local spatial claims for securing areas for fish habitats and limiting fishing activities in ecologically sensitive areas.

Alien Species: Shipping is a main vector for the introduction of alien species (ballast water and attached to the hull). Over the last decades a substantial number of new species have emerged in the Baltic Sea, disturbing ecosystems[13]. MSP includes activities/sectors, which may have an impact on spreading alien species, but other international regulations (Ballast Water Convention) address this issue.

13 For example, the recently established round goby has formed a substantial population in Latvian coastal waters. Because it has few natural enemies, its negative pressure on coastal habitats increases, among others - by outcompeting local mussel eating fish species (e.g. turbot) as well as by destroying reef habitats formed by mussel colonies.

Pollution: The marine environment is also polluted by hazardous substances released through wastewater, agriculture run-off, shipping, harbour operations and off-shore installations. Hazardous substances (e.g. dioxins, polychlorinated biphenyles (PCBs), brominated flame retardants, DDT, etc.) remain in the marine environment for long periods and accumulate in the food web reaching levels that are toxic to marine organisms and humans as well. Some hazardous substances in the Baltic Sea have reached 20 times higher concentration levels then in other seas, e.g. the Northern Atlantic (Ruskule et al. 2009). Even if partially regulated, some sea uses, such as shipping, still create potential pollution risks, e.g. accidents resulting in oil or fuel spills; MSP, therefore, has an important role in risk avoidance.

Physical Disturbance: Benthic habitats also suffer from the mechanical destruction by off-shore installations (e.g. cables, pipelines, wind parks), demersal trawling and shipping, including recreational vessels (speed boats and water scooters) in shallow areas. Large-scale development of e.g. OSW power or sand extraction can compete for shallow offshore banks and pose a threat to bird populations. Here, species like the long-tailed duck overwinter due to the richness of e.g. blue mussels.

Climate Change and Important Future Sector Trends: Climate change is recognized as a major factor influencing the future of the Baltic Sea ecosystem. The HELCOM climate change project, BACC (2008) reports a potential increase of air temperature by the end of century by 4-6oC in northern areas of the Baltic Sea and by 3-5oC in southern areas (unless adequate measures are taken). This would result in a 50-80% reduced ice cover. A comprehensive assessment on climate change in the Baltic Sea areas (HELCOM, 2013a) indicates a constant increase of surface water temperature since 1985, with the highest increase observed in the Northern Baltic Sea, the Gulf of Finland and the Gulf of Riga. Climate models also predict a considerable increase of winter rainfall in the entire Baltic Sea area, leading to increased nutrient run-off (estimated 6-20% increase for the Latvian part of the Baltic Sea catchment area). Moreover, an expected decrease of oxygen concentration in bottom waters would make the ecosystem more sensitive to increasing nutrient loads. Changes in marine ecosystems will be largely determined by interactions of climate change but in combination with human-induced factors, such as: the levels of eutrophication and pollution, fishing intensity affecting the fish population structure and food chain interactions, the introduction of alien species, as well as a level of species disturbance and habitat fragmentation by shipping and off-shore installations.

Increasing ship traffic implies a higher risk level of collisions and pollution and increasing disturbance of endangered species. This might particularly become a concern in the shallow banks in the Swedish part of the Central Baltic area south of Gotland. The development of fish aquaculture and related risks of eutrophication can be especially harmful to the ecosystem of the Gulf of Riga. OSW energy production might compete for space in the ecologically valuable shallow coastal and offshore areas. Extensive development of OSW parks can also have cumulative impacts on bird migration on the whole Baltic scale.

A mapping of areas of high ecological value is an essential precondition to implement an ecosystem-based approach in MSP. This will allow to a) assess the coherence of existing MPA networks; b) identify areas to investigate as potential new MPAs (can be included in MSP as a particular zoning category); and c) apply the concept of blue corridors (an allocation of sea space to uses considering connectivity and functional interconnections between sites of high ecological value).

The environmental topic work in the Baltic SCOPE project focused on spatial aspects for enhancing and protecting the marine environment that can be taken into account and mitigated by MSP. This included improving the coherence of the MPA network, increasing the knowledge and understanding of interactions between marine ecosystems and human activities and ensuring that planning proposals for sea uses are in line with the MSFD objectives to achieve good environmental status.

3.1.1. Estonia: Specifics on Environmental Status and Trends

The marine waters of Estonia belong to three sub-basins of the Baltic Sea: the Gulf of Finland, the Gulf of Riga and the Baltic Proper. Similarly to other parts of the Baltic Sea, the main environmental concerns are eutrophication, invasive species and overfishing. The Estonian marine waters are mainly affected by land-based environmental processes and human activities. Mostly, they are local and primarily affect coastal areas, as human uses in Estonian marine areas are less intensive than in the rest of the Baltic. A trend analysis of important sectors in the marine economy indicates a low or moderate growth by 2020 (Ruskule et al., 2016). Thus, some increase of environmental impacts might be expected, especially from ports, cargo transport and fisheries.

3.1.2. Latvia: Specifics on Environmental Status and Trends

The marine waters of Latvia belong to two sub-basins of the Baltic Sea – the Gulf of Riga and the Baltic Proper. In this area, the major environmental concern is eutrophication and its effects (phytoplankton blooms, oxygen deficit and decreased water transparency), particularly in the Gulf of Riga. This is particularly problematic since most of Latvia's coastline is exposed to wave action preventing the formation of seabed habitats appropriate for macro algae, which would make important spawning and nursery grounds. Further pressure comes from fisheries. According to the initial assessment for the implementation of the MSFD[14], current pressure does not cause permanent alteration or damage; however, assessment methodology does not distinguish different local sub-populations of target species. Another more recent pressure on the marine environment is invasive species – not least the round goby, which has increased in the western Latvian coastal waters damaging reef habitats of mussel colonies.

3.1.3. Sweden: Specifics on Environmental Status and Trends

The Swedish part of the Central Baltic belongs to the Baltic Proper. Swedish marine habitats are marked by several decades of nutrient and toxin emissions from land and air combined with intensive fishing and other human activities. This has resulted in large-scale changes to the biotopes with silted up areas of hard substrates, overgrown shallow bays and changes in the composition species of marine ecosystems. The Baltic Sea is also home for the harbour porpoise (Phocoena phocoena), the only year-round resident whale species in this brackish ecosystem. The population in the Baltic Proper is small (ca. 500 animals) and has decreased dramatically during the last several decades. It is now listed as critically endangered by the IUCN and HELCOM. This population is genetically separated from the porpoises in the South-West part of the Baltic Sea. The Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise (SAMBAH) project concluded that the banks south of Gotland are very important for its survival. The need to protect birds and marine mammals has led to recent action outside of MSP.

3.2. CURRENT STATUS AND TRENDS IN THE ENERGY SECTOR

Spatial claims of the energy sector include both production areas at sea and the linear infrastructure, which connects production areas and distribution systems as well as countries. Even if there are larger scale frameworks and agreements, the energy sector is largely driven by national policies, the energy industry and processes in the energy market. It is up to each member state to decide on its energy portfolio, including measures facilitating the deployment of renewable energy sources (RES) technologies (see chapter 4). Presently, the energy sector's interests in the Central Baltic include Offshore Wind (OSW) energy facilities and linear installations, i.e. electricity transmission cables, gas[15] and potentially oil pipelines. Wave power is also being researched in the case study area. Wave power in the Baltic Sea has been estimated as having good potential to be commercially used in a long-term perspective (Dukulis 2013). Additionally, less established technologies include heat pumps/geothermal energy.[16]

In 2015, the annual onshore wind power market grew in the EU by 7.8 %, and offshore installations more than doubled compared to 2014. This confirms the increasing relevance of the OSW industry in the development of renewable energy in the EU[17]. In the Eastern and South-eastern part of the Central Baltic area, OSW energy is still at a development stage. Subsidies and support systems for the sector are important enablers, as the generation of offshore energy is generally more expensive compared to renewable onshore technology.

Currently there are no power transmission cables or operating OSW farms in the sea areas of Estonia and Latvia; however, there are several designated areas where permits for the assessment

14 Assessment of Initial Environmental Status under Marine Strategy Framework Directive completed by the Latvian Institute of Aquatic Ecology (LHEI) available in Latvian, see: http://www.lhei.lv/lv/jurasdirektiva.php

15 See international consortium Nord Stream, see: http://www.nord-stream.com/

16 Although thermal energy is most likely a local heating solution, since 2010 a pioneering heat pump project is functioning in Salacgriva, Latvia. The heat pump station (total power 1,13 MW) uses water from the Baltic sea as its primary energy source to provide thermal energy (heating and cooling). The total length of the heat collector is 5 kilometers and the pipe loops are placed on the seabed at an area of ca. 150,000 m^2.

17 European Wind Energy Association (changed to Wind Europe): Wind in power, 2015 European statistics, see: https://windeurope.org/

of conditions and exploration of wind energy have been granted. Overall, economic profitability (due to technology costs) of offshore energy, as well as the lack of legal regulation, has hindered a development of OSW farms in Latvia, and to some extent also in Estonia. So far, Sweden has five established OSW farms, four of them in the Central Baltic area and located within territorial waters.

There are no direct interconnections between Central Baltic area countries; however, there is NordBalt HVDC (High Voltage Direct Current) interconnection linking Sweden and Lithuania across the central part of the Baltic Sea, and the EstLink 1 HVDC cable connecting Estonian and Finnish transmission grids across the Finnish Gulf. Although not indicated in the European Network of Transmission System Operators for Electricity (ENTSO-E) ten year network development plan (2016)[18], a possibility exists that in the longer term, and under certain conditions, one or more submarine HVDC cables could be drawn between Latvia and Sweden, Latvia and Estonia, as well as Estonia and Sweden. Current interconnections (terrestrial and marine) are satisfactory, but improvements are needed for a further integration of EU internal energy markets and for increasing the energy security of EU member states, including the Baltic Sea region.

The Baltic States are under increasing pressure to quickly expand their renewable energy potential, onshore and offshore, not least through EU-policy (see chapter 4). The energy sector's spatial claims are expected to increase, competing with other marine-use activities, such as defence, fisheries and maritime transport. The expansion of the energy sector can also increase pressure on the marine environment. The spatial need for linear infrastructure for future interconnections will be relatively limited, but potentially competing with other marine uses in specific areas. The future dynamics of expansion of RES, including and in particular of OSW technologies are directly impacted by the EU emission trade system, CO2 policy (European Commission 2014) and the price for CO2 emissions. If there are favourable conditions for OSW and other RES technologies, this spatial claim will increase competition among existing, expanding and new marine uses.

Estonia: Current Status and Trends in the Energy Sector

So far, development of the energy sector has been limited in Estonian marine areas. Preparation for the production of renewable energy has started in the north-western part of Estonian territorial waters (around Hiiu island) and in the Gulf of Riga. An increase of spatial claims is mostly expected from the renewable energy sector and from grid connections between energy production areas and the mainland. The Baltic Connector pipeline from Estonia to Finland and the Nord Stream pipeline (outside the Estonian EEZ) will require spatial needs and have environmental effects.

Latvia: Current Status and Trends in the Energy Sector

Latvia is currently increasing capacity in its power transmission network. With the help of co-financing programmes from the EU, Latvia's current investment in energy infrastructure is led by Kurzemes loks, a project comprising installation of new 330 kV high voltage overhead power lines in the western part of Latvia for a 340 km stretch, with an expected capacity of 800MW. The project is expected to be finished by 2019. There are currently no power transmission cables laid out in Latvian marine waters, and no power cables are placed in the Gulf of Riga either. However, Latvia is exploring submarine electricity transmission cables including one connecting Latvia and Sweden and one connecting Latvia and Estonia.

The proposed Latvian Maritime spatial plan (Ministry of the Environmental Protection and Regional development 2016) includes two areas suitable for OSW development in the Baltic Sea (approximately 30 km off the Latvian west coast and 207 km2 in total). Interested developers will have to apply for a license and conduct EIA. The plan also refers to potential electricity cables and underwater cable protection zones to connect suitable areas to the onshore grid. Furthermore, an area for exploration of wave power technologies has been designated in the proposed plan.

Sweden: Current Status and Trends in the Energy Sector

Wind energy is currently the renewable energy resource with the strongest development in Sweden, driven both by national policy objectives (10 TWh by 2020, see Chapter 4) and market

18 See: http://tyndp.entsoe.eu/

development. The Swedish Energy Agency has pointed out 27 areas at sea as areas of national interest for wind energy production, a total area of approximately 4,000 km². Basic criteria have noted a mean annual wind speed of 8 mps, maximum depth of 35 m and areas larger than 15 km². At the moment, several OSW projects are under different stages of implementation. Regarding transmission systems, Swedish Power Nets (Svenska Kraftnät), is analysing future connections to Finland, Germany and Gotland.

New technologies such as wave power and floating wind turbines are still under development and difficult to plan for at present, however, there is a need for pilot areas at sea for these new technologies and the Swedish Energy Agency is planning wave energy resource mapping. No floating commercial wind facilities are in operation and none are expected before 2020. By 2035-2050, a higher profitability of offshore energy is expected at the same time as the ongoing energy conversion and geopolitical reasons will make new demands on energy supply (SwAM 2016, thematic report on energy).

3.3. CURRENT STATUS AND TRENDS IN THE FISHERIES SECTOR

From a MSP perspective, the fisheries sector has two fundamental characteristics with spatial implications: a) viable habitats for a healthy resource: as fish depend on spatial conditions for spawning and nursing, and b) access to harvest grounds: fishing depends on space and access to fishing grounds, as well as onshore connection to harbours for landing the catch, supply, and berthing.

Habitats: The Central Baltic area features essential fish habitats for herring, sprat, cod and flounder. Fish nurse, spawn and migrate between nations around the Baltic Sea. The area of these activities is known as the Essential Fish Habitat (EFH), which is described as a subset of all habitats occupied by a species, and is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (Magnuson-Stevens Fisheries Conservation and Management Act 1998). The most important nurseries for herring are located in the Gulf of Riga, and Flounder in the Irbe Strait and open waters of the Baltic Sea. The Gotland Basin is one of three major spawning grounds for Eastern cod where successful spawning is possible in a short period of time with favourable hydrological conditions. According to Aaro (1989) sprat has no specific spawning grounds and it spawns in the pelagic part of Baltic Proper. Future impacts on fish habitats are linked to possible new uses of the sea, such as wind and wave energy installations, which may significantly affect the herring and flounder spawning and nursery grounds.

Fishing grounds: The Central Baltic area includes important fishing grounds for Baltic Sea fisheries. The most important fish stocks are located in the coastal zone of the Baltic Sea and the open part of Baltic Proper. Fishing takes place in most waters. Small-scale fisheries normally operate in limited areas (long-line fisheries) and sometimes on a stationary basis (mostly fixed net fisheries). Other forms of fisheries are more mobile and are conducted over large areas (mostly trawling). Because of the transboundary nature of the Baltic SCOPE project, the focus is on commercial fisheries covering both mobile and stationary fishing methods. Recreational fishing tends to be more coastal and to a lesser extent transboundary in their activities. Moreover, there is a lack of coherent data on recreational fishing.

Commercial fishing takes place in almost every fishable location in the Baltic Sea, also in border areas of the Central Baltic. The bordering EEZ of Estonia, Latvia and Sweden is an example where vessels from the different countries fish in other countries' EEZs. Another important example is the Gulf of Riga (Estonian and Latvian waters), which has the largest coastal catches in the Baltic Sea. With some exceptions, only the national fleets fish in this territorial sea. Overall, foreign vessels are prohibited to fish at a distance below 12 nautical miles from the baseline of a neighbouring country (although agreements between countries allowing fishing in the territorial sea exist). From a pan-Baltic view, access to important fishing grounds for cod in the southern part of the Baltic is vital. Fishing locations vary over seasons, but also depend on possible changes and developments of fishing opportunities. The latter are related to changes in gear type, target species and potential changes of characteristics and spatial patterns of fish stock.

Trends: There are two major trends in fisheries in the Central Baltic area, which are to some extent interlinked. Firstly, there is an aim to develop technology to increase sustainability in fisheries. The central focus of fisheries' management is to financially support a development of fishing

gear towards better selectivity in catches. A better selectivity is expected to result in catches of the right size for sale, which can improve both the economic and environmental performance of the sector. Secondly, there is also a trend towards rationalization of the fishing fleet. Mainly the smaller fishing vessels are taken out of business while the remaining fleet tends to expand capacity.[19] Despite rationalization, improving the selectivity of fishing gear is still crucial, due to the trend of increased capacity per unit in the fleet.

These two trends put fisheries management (and to some extent MSP) in a challenging position, as they have to strike a balance between ecological and resource sustainability, economic viability and social sustainability (i.e. the strong social and cultural values that fisheries imply in small coastal communities). As MSP focuses on a spatial perspective for fisheries, a consistently problematic characteristic is also the spatial uncertainty of fish habitats. Fish move across national borders and can react to environmental stress through a changed spatial pattern of migration. Furthermore, fishing vessels operate where fish stock appears, creating a spatial and temporal dynamic in the use patterns of fisheries. Based on the discussions on fisheries, the Baltic SCOPE project put forward a need to develop better knowledge on the status and spatial changes of habitats, as well as on historic and economic perspectives on the sector's activities.

3.3.1. Estonia: Current Status and Trends in the Fisheries Sector

The Estonian trawl fisheries are concentrated to pelagic trawling for herring and sprat, mainly in the Estonian EEZ, but also in the Central and Southern Baltic, with exception of the 12 nautical mile zones of the member states. Throughout the whole year, trawling is limited to taking place 20 meters below the surface. It is also forbidden to use a bottom trawl in the Gulf of Riga. Estonian fishing vessels are landing catches in several Estonian and foreign ports in the Central Baltic area: Salacgrīva and Liepāja in Latvia, and the Ronehamn in Sweden. The most important Estonian fish landing ports are: Virtsu Kalasadam, Virtsu, Saaremaa, Roomassaare, Westmeri, Lehtma, Mõntu, Suursadam, Suursadam-kalakai, Dirhami, Veere, Kihnu, Sõru, Pärnu, Nasva jõesadam. In addition to ports, the coastal small-scale commercial fisheries use a number of additional, official fish landing spots. For Estonian fish resource management, the shallow coastal waters with less than 20m depth best correspond to the EFH definition. In addition, the spawning grounds of internationally regulated Baltic Sea herring are mapped separately and used in MSP.

3.3.2. Latvia: Current Status and Trends in the Fisheries Sector

The main grounds for Latvian demersal fisheries for cod and flounder are located in the south of the EEZ. Pelagic trawlers in the open sea are mainly fishing for sprat, while in the Gulf of Riga herring is the target species. According to data analysis for the period 2004-2013 Latvian fishermen caught 80% of landed cod outside the Latvian EEZ (Ustups 2016). Fish landings in the Latvian ports are significantly affected by the average market price of fish and the geographical location of fish stocks. Liepāja is by far the most important harbour for cod fisheries, landings of sprat are concentrated near Ventspils. The main three small landing places for herring in the Gulf of Riga are Roja, Mērsrags and Salacgrīva. Due to better market possibilities, part of the fish is landed in foreign ports, and as a result the amounts of fish landed in Latvian ports decreases. Latvia has identified the coastal zone of 10 meter depth in the Baltic Sea and the Gulf of Riga as important nurseries for many fish species (for example herring, smelt, sea trout, turbot and flounder).
Fishing intensity in the Latvian part of the Baltic Proper has decreased considerably, influenced by the EU Common fisheries policy, which optimizes the fishing capacity in relation to available resources, resulting in a reduced fishing fleet. Taking into account both limited fish resources as well as this policy, an increase of the fishing fleet, a rise of fishing intensity and related pressure is not expected in the near future.

3.3.3. Sweden: Current Status and Trends in the Fisheries Sector

Swedish fishing vessels are active in the Central Baltic area, but concentrate on catching herring. Based on landing data between 2008-2012, Swedish fishing operations can be traced to both Latvian and, especially, Estonian waters. Västervik and Karlskrona are the main

19 See http://ec.europa.eu/fisheries/fleet/index.cfm?method=RES1.Stat (2016-12-12). (European Commission, DG MARE 2016)

landing ports for Swedish vessels fishing in the Central Baltic area (SwAM, 2015). Sweden has a national regulation prohibiting demersal trawling in coastal areas. The prohibited zone covers 3-4 NM along the Swedish coast and aims to protect nursery and spawning habitats. Over the years, there have been local changes and exemptions to this.
In the thematic work on fisheries within the MSP process, management representatives identified several trends in fisheries and related businesses. Firstly, the ongoing process of the rationalization and streamlining of Swedish fisheries is expected to continue at least until the year 2035 with smaller vessels and one-man businesses being replaced by larger, economically more rational high-capacity entities. A reduced and more efficient fleet will probably have to adapt to future trends of new marine interests. A growing diversity of marine interests will affect fishing locations and lead to an increased need for co-existence with other marine uses, such as OSW farms. From a market perspective, fisheries could be influenced by trends in food industry and consumption where ecological and health related standards gain more attention. Perhaps fishing and production methods then will have to focus more on aquaculture, development and adaptation of new fishing gears as well as an increased use of passive gear to reduce the environmental impacts of fishing (e.g. bottom trawling). This development is expected to continue until 2050 (SwAM, 2016c thematic report fishing).

3.4. CURRENT STATUS AND TRENDS IN THE SHIPPING SECTOR

Shipping can be considered as a connective support system for society where marine space is used for economic purposes. The spatial claim of the sector is characterized by searching for the optimal space for safe and efficient passages at sea to landing places on the shore. Global, regional and national agreements regulate and guide shipping to ensure safe passages (see chapter 4 Institutional frameworks and processes). Landing places in ports reflect a terrestrial planning perspective of the sector where the quality of linkages and interplay between shipping, road and rail transportation is crucial for current shipping patterns at sea. EU's Trans-European Transport Network (TEN-T) network assigns four ports of the Central Baltic area: Riga, Ventspils, Stockholm and Tallinn as CORE-ports that are included as a part of the coordinated improvement of transportation networks for "facilitating the mobility of goods and passengers within the EU (Fig. 3.4-1)."[20]

In addition to the administrative guidance and regulations regarding safety the dredging of channels and harbours is a required sea use linked to the sector. Besides the natural process of fouling, demands for dredging will probably increase due to the estimated growth of traffic flows and operating vessels. More intense dredging has potentially problematic environmental effects in the Baltic Sea, which has been classed by the International Maritime Organisation (IMO) as a "particularly sensitive sea area" (PSSA). The IMO classification includes certain specific measures to be taken into consideration, including traffic management and the stricter application of requirements in respect of discharges and equipment.[21]

Shipping trends in the Central Baltic imply that both passenger and cargo vessels are becoming longer and wider. Moreover, as depth is limited to 17 m in the Danish straits, the physical preconditions of the Baltic Sea challenge these future scenarios. The most intensive shipping in the Central Baltic area takes place in Swedish waters passing the island of Gotland and heading towards the Gulf of Finland as well as traffic to the port of Riga.[22] Overall, the Central Baltic area can be considered mainly as a transit area for international shipping. However, all partner countries stress shipping as nationally important for trade and economy, with the potential to contribute to national goals of sustainable transitions in cargo logistics. Efficient planning of safe routes and qualitative connections to other infrastructure is essential for the competitiveness in the trade between Russia, Europe and Asia.

20 See http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/en/abouttent.htm retrieved 11-01-17. See also European Commission (2016) for more information.

21 See Kopti et al. (2016).

22 See Kopti et al. (2016).

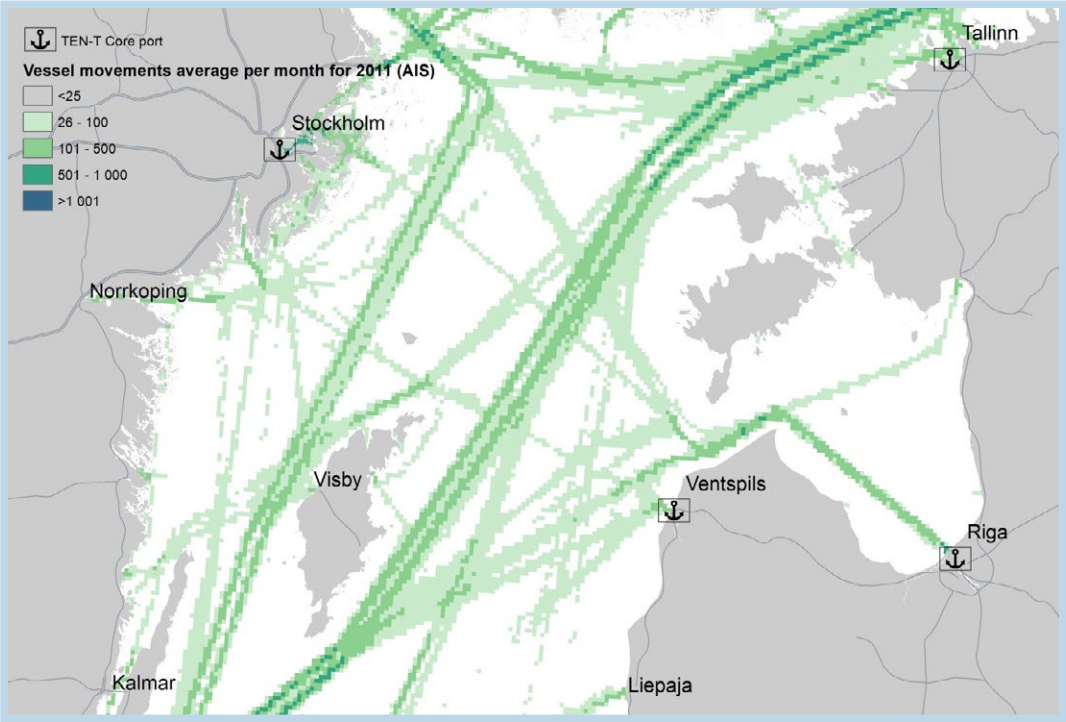


Figure 3.4-1: Map with sea traffic in 2011 and TEN-T Core ports in the CB Area: Riga, Stockholm, Tallinn and Ventspils (SwAM).[23]

As safety in shipping has to be sustained, the development of offshore energy production installations constitutes a growing challenge. Future developments with increased automatized navigation, if Sea Traffic Management[24] shipping becomes more efficient, may ease the need to widen shipping routes and instead narrow future spatial claims for safety distances between vessels in relation to other sea uses. This trend can also facilitate a possibility for the shipping sector to consider soft regulations in future, such as avoiding environmentally sensitive areas without IMO regulations (SwAM 2016d shipping p. 9).

3.4.1. Estonia: Current Status and Trends in Shipping

The Estonian shipping sector is currently of high priority in terms of traditional marine use, and of huge importance for export comprising 60% of the total export (Estonian Ministry of Economic Affairs and Communications 2012). Shipping, including related infrastructure on land, is viewed as an important tool for economic growth.

Estonia has a number of harbours with good export potential, but is, at present, untouched by international transit flows. The harbours of Pärnu, Virtsu and Roomassaare could improve the competitiveness of local economies and export, or import goods important for those regions. Saaremaa harbour could be developed further for freight transit and also, together with the port of Pärnu, as destinations for sea cruises.[25]

3.4.2. Latvia: Current Status and Trends in Shipping

The importance of shipping for Latvia is illustrated by the ports, which are significant contributors to economic growth, providing 10% of the total national GDP. Riga, Ventspils, and Liepāja are three large ports characterized by ensuring services for both passage and freight shipping. These three ports constitute 98% of the total handled cargo in all ports in 2013 (Latvian Ministry of Transport, 2015). Additionally, there are seven small harbours (Engure, Jūrmala, Mērsrags, Pāvilosta, Roja, Salacgrīva and Skulte), which offer basic services for fisheries, fish processing, tourism, export and import of specific commodities.

23 Map developed by SwAM: http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/en/maps.html Retrieved 12-01-17.

24 See www.stmvalidation.eu Retrieved 12-01-17.

25 See Estonian Ministry of the Interior (2012) p.41.

Overall cargo export exceeds the flows of import in all Latvia's ports. Multimodal connections and land infrastructure are crucial for the further development of the sector. Between 2004 and 2014, all ports in Latvia showed growth in import and export cargo, with the port of Riga having the most stable growth unit. Aside from cruises, the main passenger transportation takes place to and from different ports on routes connecting Latvia and Sweden and Latvia and Germany.

Forecasts predict that the ports of Riga and Liepāja will remain attractive, while the port of Ventspils will not have a significant increase of traffic.[26] According to the future development plans of the Latvian ports, main connections of passenger and cargo freight are predicted to form with Swedish, Estonian and Finnish ports, as well as through the TEN-T route to ensure connections with ports in Poland, Germany and beyond the Baltic Sea. The future development of operating vessels is estimated to focus on growth in cargo turnover as a result of increased vessel capacity (size), rather than an increase of shipping density.

3.4.3. Sweden: Current Status and Trends in Shipping

The Swedish industry relies greatly on maritime transport and port operations where the location of ports has been determined by the location of the industries they serve (The Swedish Maritime Administration 2013). The largest Swedish ports in the Central Baltic are the ports of Stockholm and Norrköping, where major investments have been made in recent years; however, the flow of cargo in Sweden is primarily related to the major transoceanic ports in the North Sea. Moreover, Swedish waters are important transit routes for foreign fleet shipping between other countries, mainly with Russia as a final destination.

Of cargo volumes, which in 2010 amounted to roughly 170 million tons, cargo ships transported around 80%; ferries accounted for the other 20% (SwAM 2015 p. 85). Passenger traffic is of great importance, with a large number of international ferry links. Sweden has such links with Denmark, Germany, Poland, Lithuania, Latvia, Estonia, Russia, Finland and Norway. Swedish cruise traffic in the Baltic Sea accounts for over two million passengers annually out of a total of 30 million passengers (ibid. p. 86). Vessel size and the volume of goods in Swedish ports have increased substantially in recent decades, reaching vessel numbers that are close to the capacity limit of existing shipping routes. This stresses the need for management efforts to deepen and for shipping routes to widen in the future. Moreover, strategic goals of the sector aim to maintain flexibility as well as higher environmental standards of their operations. Shipping of overseas goods is expected to double by 2050 (ibid.). This may call for wider routes and more separation zones, as condensed traffic reduces safety.

3.5. SECTOR STATUS AND TRENDS: OBSERVATIONS IMPORTANT FOR DEVELOPING TRANSBOUNDARY MSP IN THE CENTRAL BALTIC

Summing up, it is important to further analyse the status and development trends in all sectors representing important economic drivers, but also other pressures in the Baltic Sea area. Overall, from a marine environmental perspective, human maritime activities are expected to increase with the anticipated growth of existing maritime sectors, as well as other emerging interests. Together with climate change, this represents an especially serious threat to sensitive marine ecosystems in shallow and coastal areas that need to be addressed in a comprehensive manner. Climate change can also affect specific use sectors.

Work with status and trend analysis here showed a need for spatial visualization and the lack of consistent data on basic environmental conditions and several marine uses, but also a lack of prognoses/future perspectives in some sectors. The attempts to assemble data and produce maps indicated a need to collect more data and harmonise it. This work is presented in chapter 5 on planning evidence. The interactions and connections across sectors also need further attention through cross-sector analysis – the initial results and reflections can be found in chapter 6. Moreover, in order to practically deal with different sectors across boundaries, planners also need to have an overview on the institutional frameworks regulating MSP and the different sectors (chapter 4).

26 See Kopti et al. (2016), p.24.

4. INSTITUTIONAL FRAMEWORKS AND PROCEDURES FOR MSP AND SECTOR PLANNING IN THE CENTRAL BALTIC

The Central Baltic planners needed to develop a combined picture of their respective marine planning and management systems. Three different MSP systems had to be accounted for, all at different planning stages. Moreover, integrating the sectors in MSP, a planner has to be aware of a number of institutional actors, at different levels, to be involved as well as crucial regulations and documents that have to be respected; these are not necessarily at equal levels across the sectors.

This chapter gives an overview on the complex institutional situation. Maritime Spatial Planning occurs in a world of different regulations, international conventions, policies and strategies that influence how marine space is used and how each sector is managed. In the Central Baltic area MSP has to follow international and regional regulations and agreements, regional strategies and guidelines and national regulations and strategies. Numerous different regulations affect what MSP can achieve at sea as a whole or within a specific sector, and to what extent. To understand how MSP can address and accommodate the needs and impacts of the four sectors – environment, energy, fisheries, and shipping – in the Central Baltic, one needs to know both the overall planning systems of all countries concerned and the relevant issues in each specific sector. Thus, after a short introduction to the three different MSP systems, this chapter presents important institutional actors and frameworks, for each sector, (incl. conventions, laws and regulations) that regulate and influence each sector at different levels, and it presents figures applicable to the most important characteristics in regards to this sector in MSP.

The main characteristics of national MSP systems of Estonia, Latvia and Sweden and the status of ongoing planning are summarised in table 4-1. The boundaries and responsibilities vary between different institutional levels (rows 1 and 4) across these Central Baltic countries. For instance, MSP is carried out by ministries in Estonia and Latvia, whereas in Sweden a national authority is responsible for the process. It is also relevant to know whether plans for marine activities are binding or merely directional, and for whom (row 3). It is also important to know how stakeholders are involved and how a plan is linked to other planning levels, particularly affecting the management of land-sea interactions.

Table 4-1: Maritime Spatial Planning Systems and Status in the Central Baltic

Country	ESTONIA	LATVIA	SWEDEN
Boundaries	A state plan is developed for the whole area of the Baltic Sea under Estonia's jurisdiction. This also includes the EEZ and coastal areas on land. **Note:** There is no overlap with municipal plans, including terrestrial plans (see section "Level of obligation" in the current table).	A state plan is developed for the whole area of the Baltic Sea under Latvia's jurisdiction. **Note:** 2 km overlap with municipal spatial plans (no plans adopted or in elaboration phase so far).	State plans EEZ until 1 NM from the base line. 3 plans for different marine areas: Bothnian Bay, Baltic Sea, Western Sea. **Note:** 11 NM overlap with municipal territorial planning.
Enactment for MSP	The plan is developed based on the Planning Act of Estonia. Regulation for Maritime Spatial Planning is in force since July 2015. An ordinance from the Government of Estonia for the development of the plan has been given in order to start the official process. Expected adoption date: February 2017.	In accordance with the Spatial Development Planning Law (in force since December 1st, 2011). MSP has also been elaborated according to Regulation No. 740 of the Cabinet of Ministers on the Procedures for the Development, Implementation and Monitoring of the Maritime spatial plan (in force since 30 October, 2012).	**National Planning** is based on the Environmental Code (SFS 1998:808), especially chapters 3 National interest areas and sustainable land/ water management principles, and ch. 4 with the national MSP amendment from 2014 (§10). This is further specified in the MSP ordinance (SFS 2015:400). **Local planning** is based on the Planning and Building Act (SFS 2010:900.)

Country	ESTONIA	LATVIA	SWEDEN
Level of obligation	Guidance for authorities can include binding decisions, especially for construction works that do not have permanent connection to the shore. Recommendations are also given that should be followed when planning or developing coastal areas.	Guidance for authorities can include binding decisions.	Directional for authorities (non-binding). The government can adopt binding provisions if they are needed to fulfil the purpose of a Maritime spatial plan.
Responsibilities for MSP	The Ministry of Finance, and the Minister of Public Administration leads the process, national sector authorities contribute.	The Ministry of Environmental Protection and Regional Development leads the process, national sector authorities contribute.	SwAM leads national process, national sector authorities contribute. Coastal County Administrative Boards assist national MSP process, coordinated by 3 Lead County Administrative Boards: Västra Götaland, Kalmar, Västernorrland. The County Administrative Boards also control municipal plans, checking for national interests and cross-municipal harmonization.
Who adopts the plan	Estonian Government for national MSP.	Latvian Government for national MSP. **Note:** for 2km of marine coastal waters, overlap with municipal spatial plans adopted by its councils.	Swedish government for national MSP. Municipal parliament for local MSP.
Stages of public hearing and review	Statutory (preliminary dates): Terms of reference for the plan and SEA program (May 2017). 1st draft of MSP and SEA report (January 2018). 2nd draft of MSP and SEA report (September 2018). Final MSP and SEA report (September 2019). + Extra public hearings in regions and local governments during the process.	Consultations and hearings (2015-2016). 1st edition draft and SEA (May 2016). Inter-institutional consultations (ongoing since June 2016); Final version of plan and SEA (by the end of 2017).	Dialogue (extra, 2016-17). Consultation (statutory). Review (statutory).
Timing of plan revision	Statutory revision every 10 years.	After adoption, revision of marine spatial plan every 6 years.	Statutory revision as needed or at the latest every 8 years.
Process status	Official process to be started in February 2017. Terms of Reference and baseline studies carried out in 2016. Two pilot Maritime spatial plans developed in 2012 – 2016 around Hiiu island in Pärnu Bay area (both in territorial waters).	1st edition draft prepared (May 2016). Inter-institutional consultations (ongoing since June 2016)	Transboundary dialogue under way since 2013. Current status (2014), final version (2015). Sector interest mapping with national authorities and cross-sector conflict & synergy analysis (spring 2016). Roadmap report final version (October 2016). Public dialogue with national stakeholders on 1st draft of plans (December 2016).

Sources: Baltic SCOPE compilation using national planning legislation. [27].

27 Planning Act of Estonia available online: https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/502012017006/consolide.
Swedish Environmental Code in English online: http://www.government.se/legal-documents/2000/08/ds-200061/
Swedish Planning and Building Act in English: http://www.boverket.se/globalassets/publikationer/dokument/2016/legislation.pdf

Before expanding on sector specifics below, some basic institutional frameworks and actors affecting all sectors and levels, and MSP as a whole, have to be acknowledged:

Firstly, from a global perspective, a number of conventions, regulations and management bodies are of relevance, usually with a sector perspective. The most important and more encompassing convention influencing the use of marine areas and MSP as such is the **United Nations Convention on the Law of the Sea (UNCLOS)**[28] on delimitations of marine boundaries to be implemented in national legislation. This includes definitions of the rights of national states to marine resources and the use of the sea for maritime traffic and cables, but also numerous principles that need to be followed (environment, research, human welfare etc.). A second global convention, where MSP and an integrated approach to marine activities and the marine environment are key, is the **Convention on Biological Diversity (CBD).**[29]

Secondly, for the Baltic Sea area in specific, the EU's policies and regulations must be considered. The **Integrated Maritime Policy** (IMP)[30] of the EU highlights the importance of increased coordination between different sectors to enhance Blue Growth. The **Marine Strategy Framework Directive (MSFD)**[31] sets the scene for environmental considerations, emphasising also the need to achieve a good environmental status (GES)[32] in the Baltic Sea. **The Maritime Spatial Planning Directive (MSP-Dir.)**[33] includes both objectives and creates a framework for MSP aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources.

Thirdly, the Baltic Sea area is well known for the cross-border cooperation in the Baltic Sea region. For spatial planning, including MSP, a multilateral co-operation organisation including 11 countries, VASAB (Visions and Strategies Around the Baltic), one of the project partners, is a pioneer. The guiding document Long-Term Perspective for the Territorial Development of the Baltic Sea Region till 2030[34] envisages that in 2030 the region should have integrated land and sea space planning, an understanding is reached that sea is a common asset and a development resource for all Baltic Sea countries, and that MSP addresses and mitigates potential sea use conflicts. Here, the collaboration with HELCOM (the Helsinki Commission with environmental focus), also a project partner, through the HELCOM-VASAB MSP Working Group[35] and its guidelines and activities are highly relevant.

In order to deal with the four different sectors in an appropriate way, either nationally or in transboundary consultations, MSP experts and participating stakeholders need to be aware of both higher and lower level frameworks and processes that influence the developments in each sector. The four sectors are embedded in varying ways, at different institutional levels - in global, transnational, marine regional and national institutions. Thus, they may need to be treated differently. In shipping, for example, strong influence is given by the global IMO regulations, whereas in the energy sector, most directions are given by national policies and objectives. Each sector's institutional embedding is presented graphically in each topic section and further described in the text.

4.1. INSTITUTIONAL FRAMEWORKS AND PROCEDURES FOR MARINE ENVIRONMENTAL PROTECTION IN THE CENTRAL BALTIC

For environmental management all governmental levels are well interconnected and more or less equally important to include. Three main tracks of legislation and important documents can be identified to be most relevant for MSP, all are not necessarily spatial from the beginning, but may have spatial implications either through the pressures managed (spatial use pressures) or through the protection measures. This includes work with GES, with the establishment of spatial protection through networks of MPAs and through strategic environmental assessment (SEA).

28 United Nations Convention on the Law of the Sea, see: http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf.

29 8. Convention on Biological Diversity. Rio de Janeiro, 5 June 1992, see: https://treaties.un.org/doc/Treaties/1992/06/19920605%2008-44%20PM/Ch_XXVII_08p.pdf.

30 REGULATION (EU) No 1255/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 November 2011 establishing a Programme to support the further development of an Integrated Maritime Policy, see: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2011:321:FULL&from=EN .

31 DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 June 2008 establishing a framework for community action in the field of marine environmental policy http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0056&from=EN .

32 For a definition of GES by the European Commission, see European Commission (2016a).

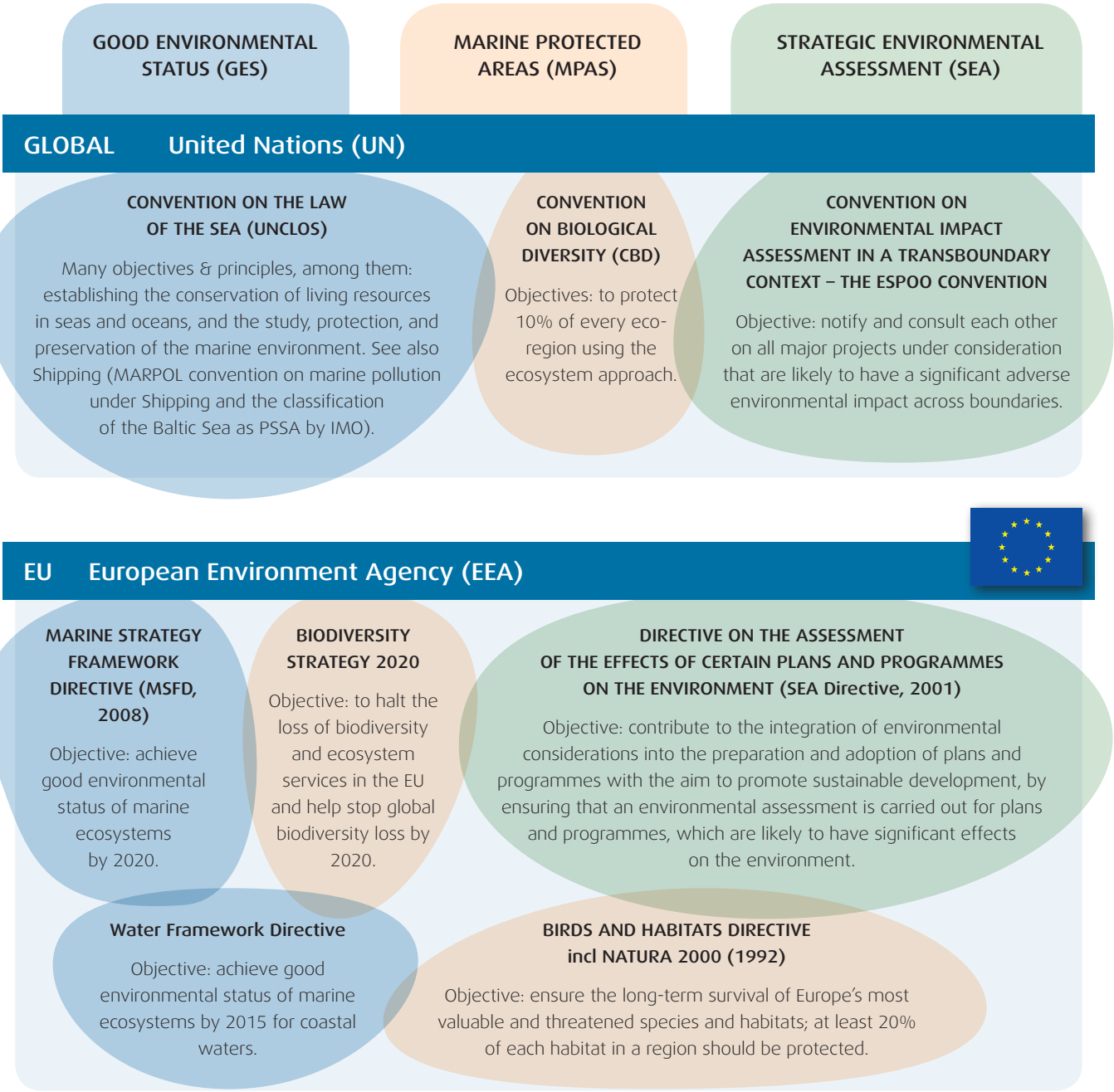
33 DIRECTIVE 2014/89/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 July 2014 establishing a framework for Maritime Spatial Planning http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0089&from=EN.

34 Long-Term Perspective for the Territorial Development of the Baltic Sea Region till 2030 www.vasab.org/index.php/documents/doc_download/8-vasab-long-term-perspective-for-the-territorial-development-of-the-baltic-sea-region.

35 For more information, see: http://www.vasab.org/index.php/maritime-spatial-planning/msp-wg and http://www.helcom.fi/helcom-at-work/groups/helcom-vasab-maritime-spatial-planning-working-group .

These tracks are also shown in the overview figure on institutional frameworks and procedures for the environmental sector (Fig. 4.1-1). The presence of different types of environmental regulations at all levels indicates that the environmental sector is one of the most highly regulated and probably most complex sectors to be handled in MSP. A core spatial mechanism to protect marine biodiversity and ecosystems (a must from the global level to national) are MPAs. So far, MPAs have mainly been established from a national spatial perspective (e.g. size and habitat type). However, the establishment of networks of MPAs is a transboundary issue, as the connectivity and coherence of such networks is important for preserving larger marine ecosystems functionality – in the Central Baltic case study, the whole Baltic Sea (Fig. 4.1-2). **Maritime Spatial Planning can help to enhance the connectivity of MPA networks by applying the concept of blue corridors** not the lest in connection with the implementation of Baltic Sea agreements and European Directives.[36] At present, however knowledge on functional interactions within and among habitats and ecosystems is not yet sufficient to build a coherent and connected network of MPAs, both nationally or in a transboundary context (for further work and recommendations, see chapters 5.1 and 7.1).

36 The Birds and Habitats Directives: European Parliament and Council of the European Union. (1992 2000, 2001, 2008, and 2009a) and the Baltic Sea Action plan (HELCOM 2007).



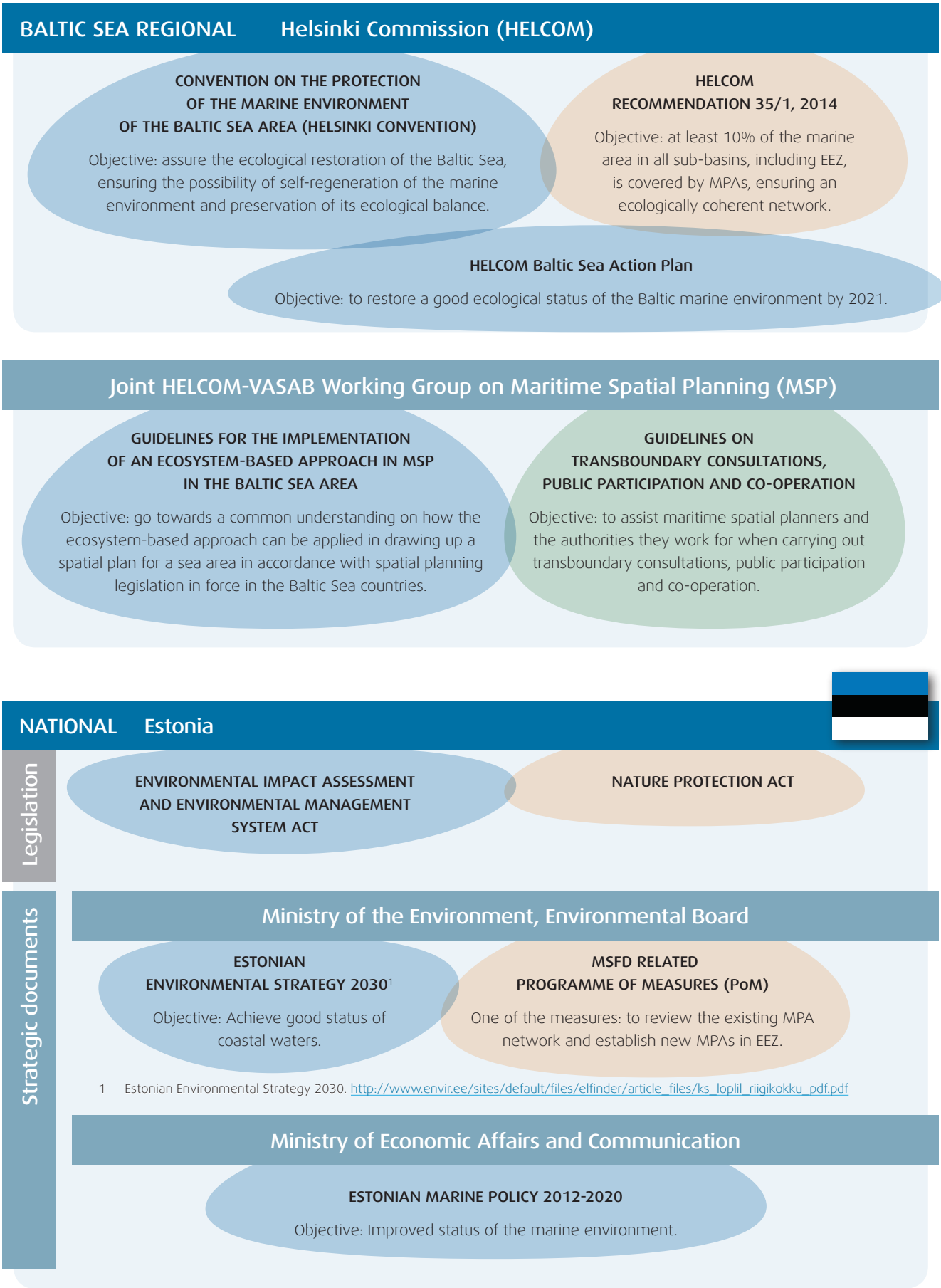


Figure 4.1-1: Overview of important institutional actors and frameworks to manage the marine environment in the Central Baltic Sea

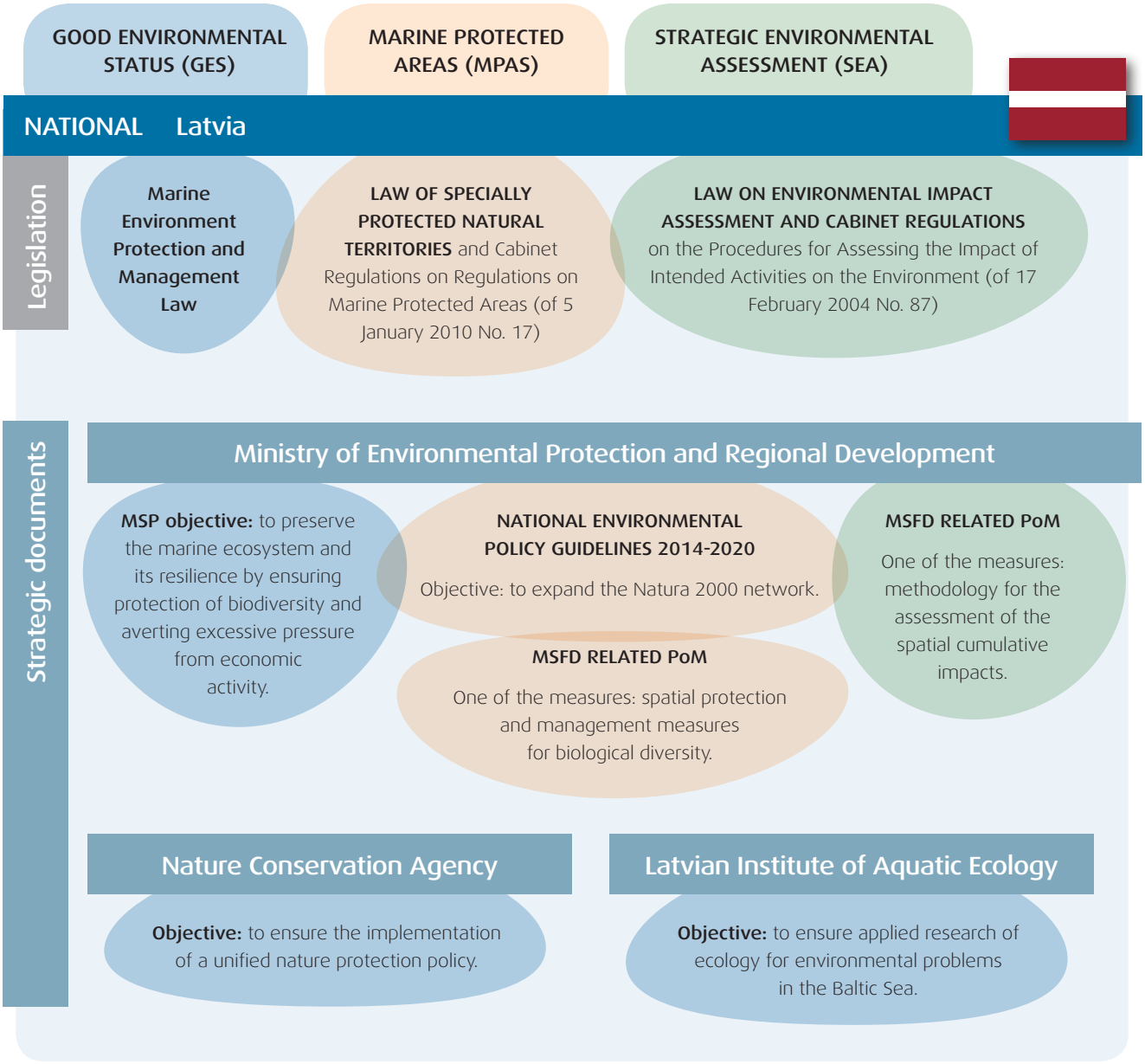


Figure 4.1-1: Overview of important institutional actors and frameworks to manage the marine environment in the Central Baltic Sea (Continued)

NATIONAL Sweden

Legislation

ENVIRONMENTAL CODE
(SFS 1998:808) Comprehensive law including both pollution, MPAs and EIA/SEA

ENVIRONMENTAL CODE – designation of areas of national interest for the environment – SwAM and EPA

MARINE ENVIRONMENTAL ORDINANCE (SFS 2010:341)

Implementing the MSFD, applies to the outer sea.

ENVIRONMENTAL IMPACT STATEMENTS AND SEA REPORTS ORDINANCE
(SFS 1998:905)

WATER QUALITY MANAGEMENT ORDINANCE (SFS 2004:660)

Implementing the Water Framework Directive (WFD) for inland and coastal waters.

Strategic documents

Ministry of the Environment and Energy

SWEDISH ENVIRONMENTAL OBJECTIVES

Objective: balanced marine environment, flourishing coastal areas and archipelagos through among other the achievement of good environmental status. The objectives are encompassing and can also be implemented spatially (e.g. by MPAs).

SWEDISH NATIONAL STRATEGY FOR BIODIVERSITY AND ECOSYSTEM SERVICES (2014)

Objective: increase the MPAs to 10% of marine areas by 2020.

Swedish Agency for Marine and Water Management (SwAM)

Objective: to establish the conditions under which a good environmental status prevails, provide information on environmental quality standards and indicators according to the Environmental Code and decide on programmes of measures for the Baltic Sea.

NATIONAL ACTION PLAN FOR MPAs

Objective: the network of MPAs is to be efficiently managed, ecologically representative and interconnected.

SwAM (sea and water) Swedish Environmental Protection Agency (overall & land based)

SWEDISH ENVIRONMENTAL OBJECTIVES

Objective: balanced marine environment, flourishing coastal areas and archipelagos through achievement of good environmental status. The objectives are encompassing and can also be implemented spatially (e.g. by MPAs).

FOR MPAs

Objective: the network of MPAs is to be efficiently managed, ecologically representative and interconnected. Increase the MPAs to 10% of marine areas by 2020.

County Administrative Boards

Contribute to implementation through regional objectives and their implementation.

Propose new and manage current MPAs.

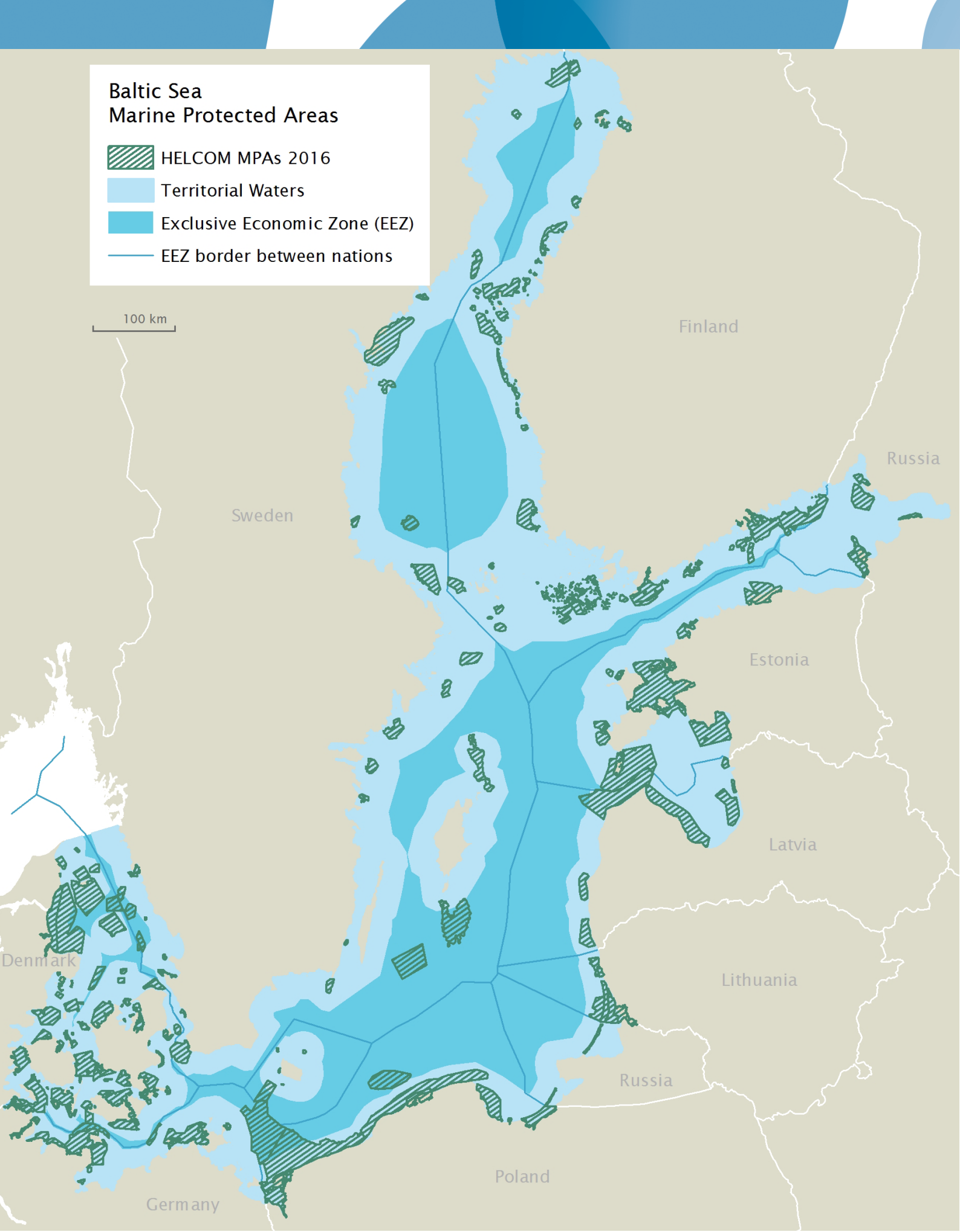


Figure 4.1-2: MPA network in the Baltic Sea (HELCOM 2016b p. 10)

4.2. INSTITUTIONAL FRAMEWORKS AND PROCEDURES FOR THE ENERGY SECTOR IN THE CENTRAL BALTIC

A number of regional agreements and legislation on energy are relevant for the establishment of marine energy production, distribution and its future development. These also affect the sector's relation to MSP, even if it is not as complex as for the environmental sector. An important example for relevant international agreements beyond Europe is the Paris Agreement, mainly with directions on the use of renewables.[37] Otherwise, regulation of the energy sector has a regional, mostly European, perspective. The EU also pursues an energy policy based on decreasing carbon emissions and increasing the share of renewable sources in energy production and consumption. The European energy legislation and policy Winter Package[38] continues on this track by emphasizing the role of renewables in energy production, research and development and increasing future competitiveness of the EU on a global scale.

A key challenge of MSP in relation to the energy sector is to get the production structures for OSW power and other renewables established in marine space. There is a direct link between the EU's energy policy and the possibility to expand energy generation from renewables, as EU member states build their national policies and renewable energy schemes based on broader EU policy and regulation. The EU Renewable Energy Directive sets the policy framework for deploying renewable energy technologies. Similarly, the EU Emission Trading Scheme (ETS) sets the price for CO2 emissions. Similarly, ETS sets the framework pricing for CO2 emissions. A low-carbon economy based on a cost-effective reduction of greenhouse gases is an essential element of the European Energy Union's strategy. Incorporating a real CO2 price in energy production costs would make fossil energy less and renewable energy more competitive from a market perspective as well. Then, renewables would no longer need expensive subsidy schemes. This scenario, envisaged by the European Commission sets a completely different stage for a broad spectrum of renewable energy technologies, including, but not limited to OSW. MSP needs to take such energy policy advancements and the evolution of legal frameworks into consideration when pointing out marine space for different activities. Thus, regarding (renewable) energy management, the overall legal framework for energy production, be it a support scheme or the CO2 price, has a direct impact on MSP although it is not MSP related regulation.

The structure and content of Figure 4.2-1 indicates two important characteristics when dealing with energy in MSP – it is clearly a regional or national issue and the main focus is on renewables and OSW energy.[39] OSW energy is mostly a question of national MSP when it comes to the space it uses. Still, it can have transboundary implications, if installations are close to borders or due to cumulative effects (e.g. impacts on biotopes, habitats, migration of species) if a larger number and capacity of aggregates are placed in the same area. So far, except for an Estonian OSW power establishment near the Estonian-Latvian border (between the Pärnu and the Riga Gulf), which might affect nature protection of Latvia, the deployment of renewable energy structures does not have much transboundary character in the Central Baltic area.

37 The Paris Agreement, UN Treaty https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&clang=_en.

38 Proposals on clean energy for all Europeans, European Commission, 30 November 2016, https://ec.europa.eu/priorities/priorities/energy-union-and-climate/proposals-clean-energy-all-europeans_en (European Commission 2016) and the already adopted European Directive on promoting renewables by the Parliament and Council of the European Union. (2009b). For further EU strategies and policies regarding energy see also: European Commission (2016b), the European Commission website with strategies for different decades, the and the 2020 and 2030 Energy Strategies there (EC 2016c and 206c) .

39 For regional EU-policy in the Baltic, see Baltic Energy Market Interconnection Plan (European Commission 2016e).

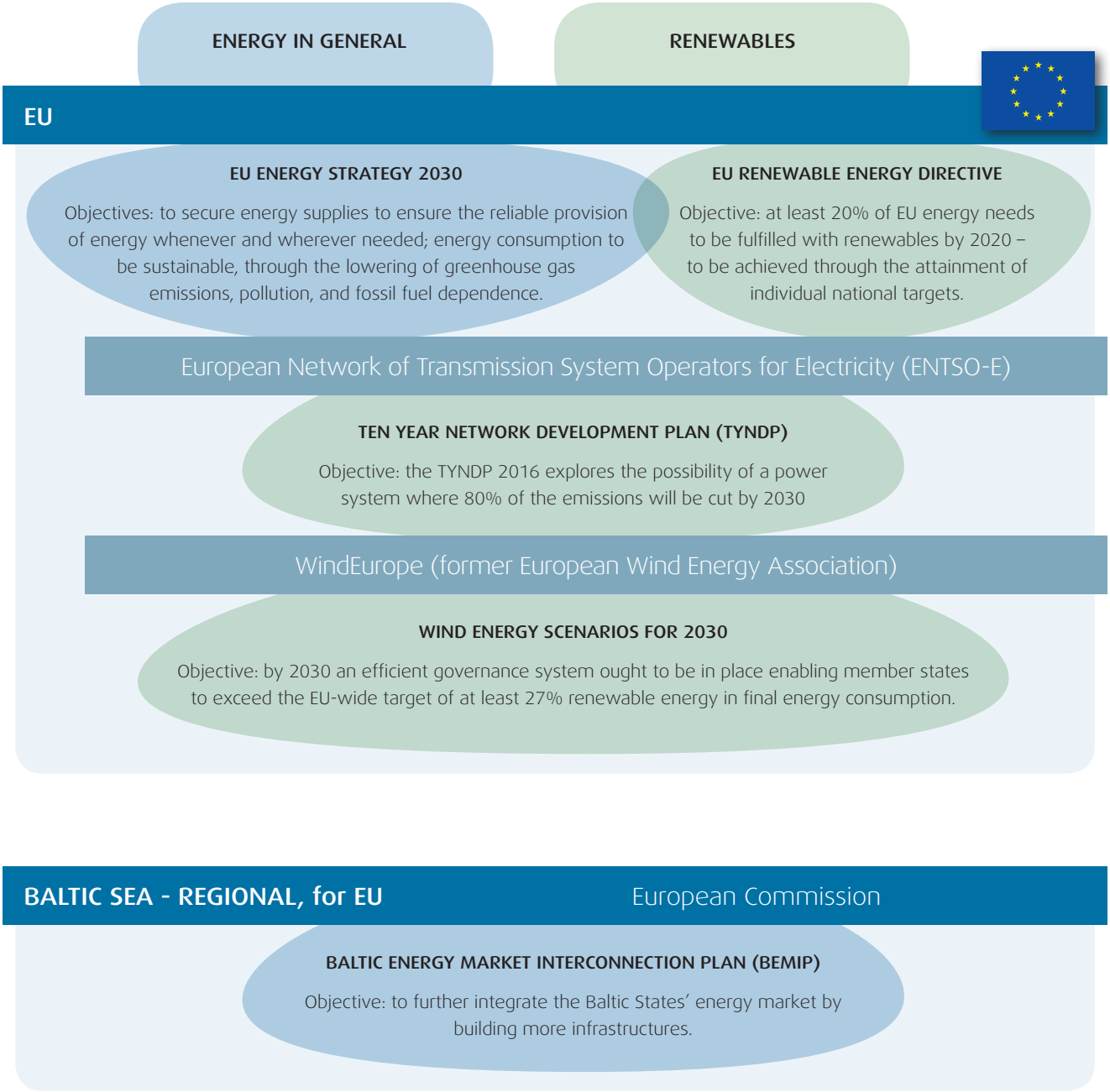


Figure 4.2-1: Overview over important institutional actors and frameworks to manage energy production and distribution in the Central Baltic Sea

NATIONAL Estonia

Legislation

ELECTRICITY MARKET ACT

Strategic documents

Ministry of Economy and Communications

NATIONAL DEVELOPMENT PLAN OF THE ENERGY SECTOR 2030

Objective: to ensure the energy supply is available to the consumers at a reasonable price and power, and with acceptable environmental conditions, while observing the terms and conditions establishedin the long-term energy and climate policy of the European Union.

RENEWABLE ENERGY ACTION PLAN 2020

Objective: to achieve a 25% share of renewables in final energy consumption.

Ministry of Finance

NATIONAL PLAN ESTONIA 2030+

Objective: potential areas for offshore energy and designation of most important connections in the long-term perspective.

MSP objective: to create prerequisites for sustainable production and transmission of energy on marine areas.

NATIONAL Latvia

Legislation

ENERGY LAW

ELECTRICITY MARKET LAW

SUBSIDISED ELECTRICITY TAX LAW

Cabinet Regulations on Construction Regulations for Structures in the Internal Waters, Territorial Waters and Exclusive Economic Zone of the Republic of Latvia (of 14 October 2014 No 632)

Strategic documents

Saeima (Parliament) of the Republic of Latvia

SUSTAINABLE DEVELOPMENT STRATEGY OF LATVIA 2020

Objective: to increase the share of renewable energy up to 50% by 2030.

Ministry of Economics

Energy Development Guidelines 2016-2020

Objective: to increase the security of energy supply and the development of sustainable energy incl. RES

NATIONAL REFORM PROGRAMME FOR LATVIA FOR THE IMPLEMENTATION OF THE EUROPE 2020 STRATEGY

Objective: to reach 40% of energy produced from renewable resources by 2020.

LATVIAN LONG-TERM ENERGY STRATEGY 2030 – COMPETITIVE ENERGY FOR SOCIETY

Object: competitive economy

Ministry of Environmental Protection and Regional Development

MSP objective: Latvia will be fully integrated in the electricity transmission network of the Baltic Sea region by 2030 and be an integral part of the Nordic-Baltic energy market.

MSP objective: to designate optimal space and location for the deployment of OSW facilities.

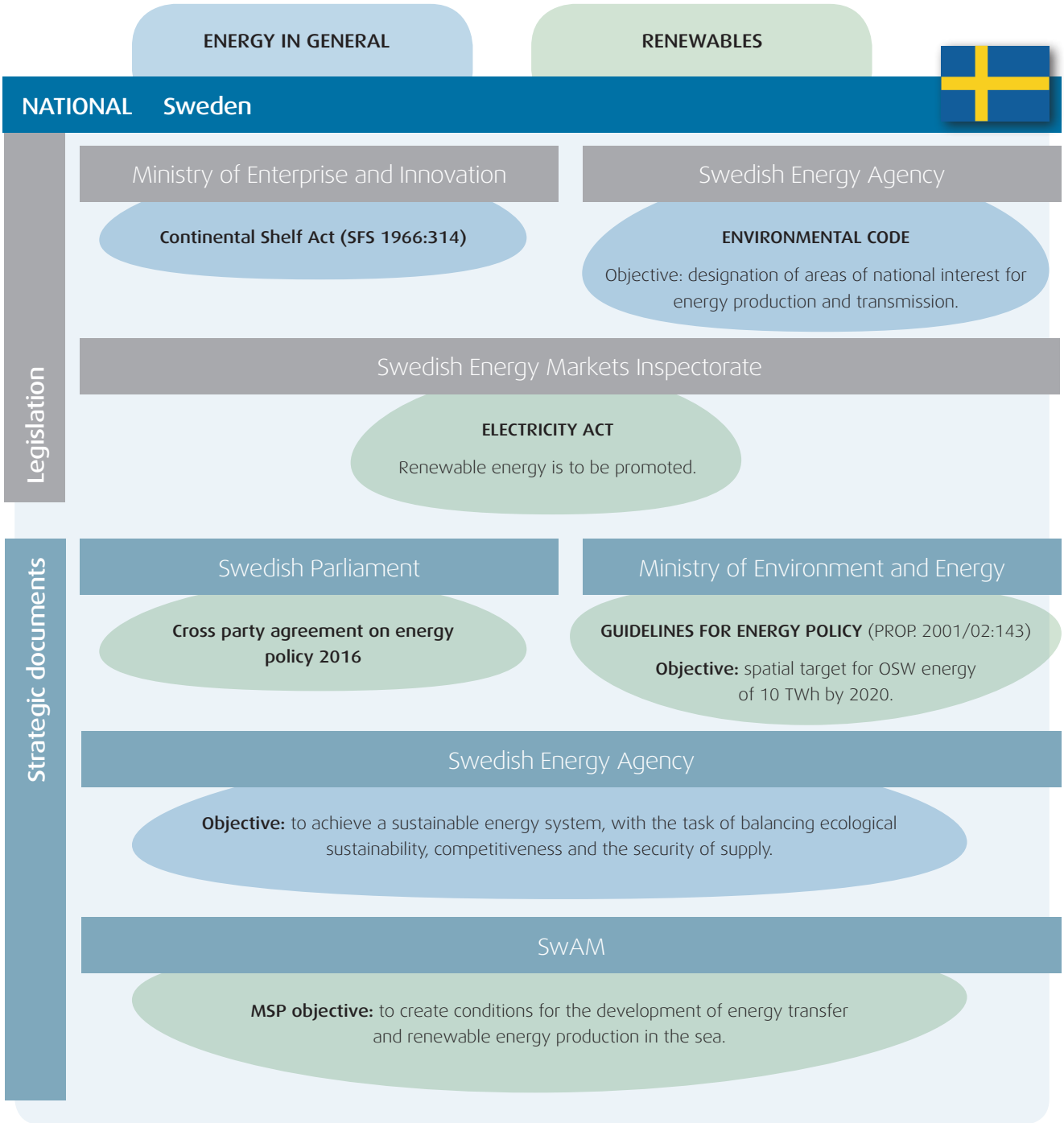


Figure 4.2-1: Overview over important institutional actors and frameworks to manage energy production and distribution in the Central Baltic Sea (Continued)

4.3. INSTITUTIONAL FRAMEWORKS AND PROCEDURES FOR FISHERIES MANAGEMENT IN THE CENTRAL BALTIC

Commercial fishing takes place in almost all fishable areas in the Baltic Sea including the border areas in the Central Baltic. In the bordering EEZ of Estonia, Latvia and Sweden vessels of different nationalities fish in the marine waters of other countries. Also fish stocks have clear transboundary characteristics: fish nurse, spawn and migrate between nations around the Baltic Sea. This results in transboundary fishing activities as well as a need to manage fisheries at a transboundary level.

Globally, fisheries is not regulated beyond environmental agreements and the rights of national states to fish within their EEZ according to the UNCLOS. Agreements on fisheries management are made regionally or bilaterally between states. The ICES, on request, assembles national data and provides synthesized statistics and advice for fisheries in different areas.

In the Central Baltic, as in the rest of the European Union, **fisheries in the EEZ is mainly regulated at EU level** to be directly implemented in **national legislation, at the same time there are strategic documents at the national level** to take into consideration (Fig. 4.3-1). In the EU, the Common Fisheries Policy (CFP) with its quota system is the main management tool, spatial and transboundary in its characteristics, and can be assisted by MSP. The quota system includes catch areas in the Baltic Sea, defined after species and used as a frame for the annually agreed Total Available Catch (TAC) shared as quota between countries. With a species perspective, the designation of catch areas tends to be transboundary as the fish stock itself. The CFP encourages feedback from regional management through regional councils for each sea basin (here: The Baltic Sea Fisheries Forum BaltFish and the Baltic Sea Regional Advisory Council). Here, management issues in fisheries can be discussed among actors from member states involved in fisheries of a specific area in the common waters of the EU. The CFP also provides provisions to nationally regulate fisheries in the territorial sea.

At the same time, in coastal (territorial) waters national regulations apply. Local fish stocks (European perch, zander, etc.) are managed at a national level, with regulation based on the best available scientific knowledge. Moreover, it is interesting to see that in Sweden an authority manages fisheries, whereas in the two other countries - ministries. In coastal waters further authority levels may become relevant.

When carrying out MSP, beyond managing **national interest areas for different types of fisheries** (which might shift over time due to ecological changes, see chapter 3), all EU member states should **ensure the sustainability of fish stocks by protecting nursery areas.** Further aspects, important to consider for sea-land connections, are the location of landing harbours and the connections to coastal waters as a recruiting area.

GLOBAL International Council for the Exploration of the Sea (ICES), Working group on spatial Fisheries Data (WGSFD)

ICES STRATEGIC PLAN 2014-2018 (scientific advice/data)

Objective: to promote the use and delivery of integrated advice in an ecosystem-based approach to fisheries and environmental management, such as integrated ecosystem assessments providing guidance on how to maintain or improve good environmental status, and advice on ecosystem health and productivity that considers drivers such as climate change and various maritime activities.

EU EU Commission

COMMON FISHERIES POLICY

Objective: to ensure that fisheries and aquaculture are environmentally, economically and socially sustainable and that they provide a source of healthy food for EU citizens.

BALTIC SEA - REGIONAL HELCOM Fish group

BALTIC SEA ACTION PLAN

Objective: fisheries management should be developed and implemented based on the ecosystem approach in order to enhance the balance between sustainable use and protection of natural marine resources.

NATIONAL **Estonia**

Legislation

FISHING ACT

Strategic documents

Ministry of Rural Affairs

ESTONIAN FISHERIES STRATEGY FOR 2014-2020

Objective: to increase the income of the Estonian fishermen, balance fishing opportunities and capacities, contribute to increasing the fish value as much as possible, and develop the potential of aquaculture as an under-utilised potential.

Ministry of Environment

ESTONIAN ENVIRONMENT STRATEGY 2030

Objective: to assure the good status of fish populations, the diversity of fish species and avoid the possible negative impact of fisheries pn the ecosystem.

Ministry of Finance

MSP objective: to set spatial prerequisites for the sustainable development and competitiveness of fisheries and fishing as an economic use.

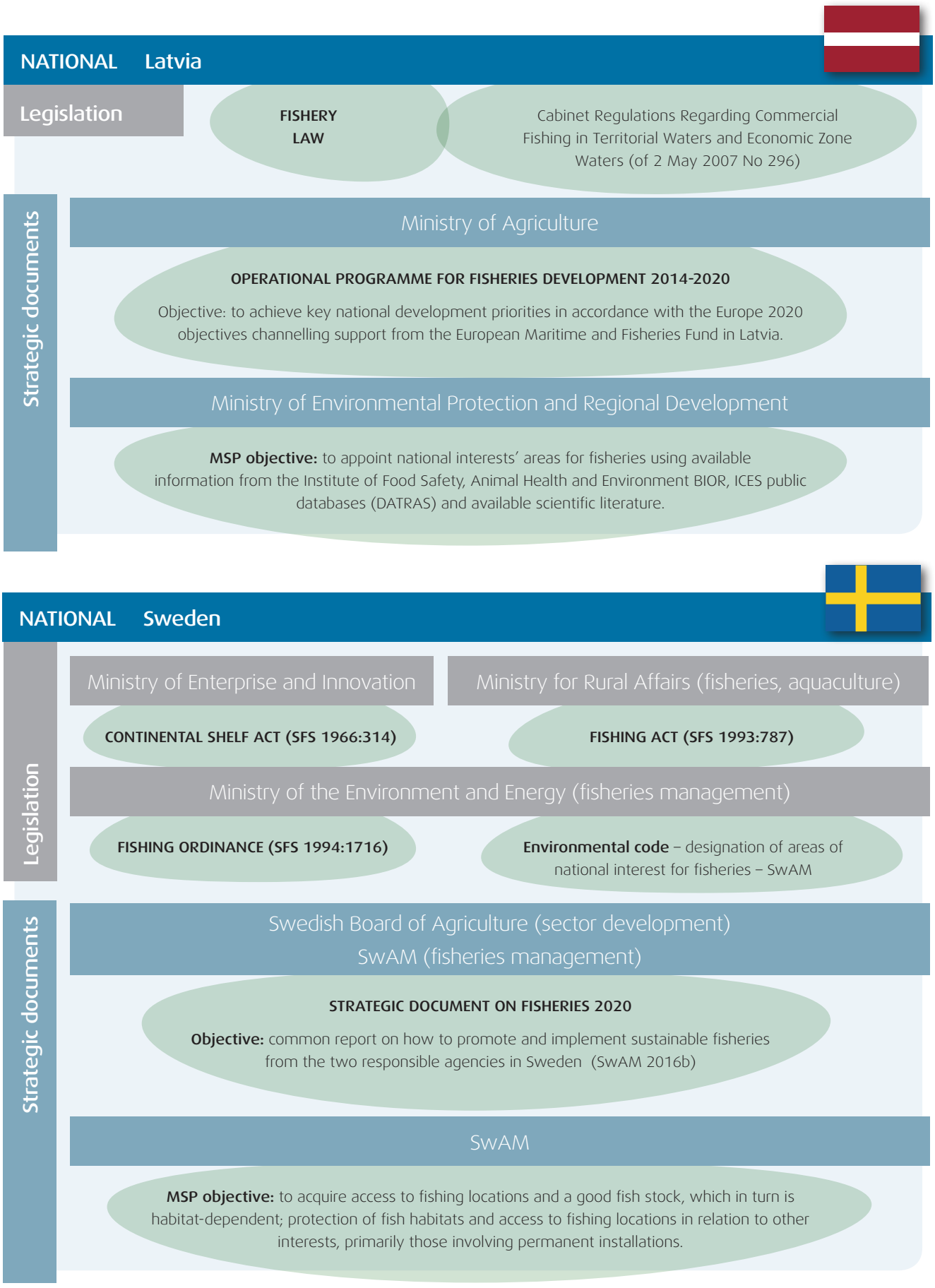


Figure 4.3-1: Overview of important institutional actors and frameworks managing fisheries in the Central Baltic Sea

4.4. INSTITUTIONAL FRAMEWORKS AND PROCEDURES IMPORTANT FOR THE SHIPPING SECTOR IN THE CENTRAL BALTIC

Basically, shipping is free to use marine space, but it has to take into account regulation according to international agreements and national rules, especially close to the shore. Fig. 4.4-1 provides an overview of regulations at different institutional and geographic levels, here sorted in four partially overlapping tracks: comprehensive regulation and boundaries, navigational safety, vessel and staff safety, and marine pollution.

Most relevant for MSP are the UNCLOS, the Convention on the International Regulations for Preventing Collisions at Sea (COLREG), the International Convention for the safety of Life at Sea (SOLAS), the Maritime Pollution Convention (MARPOL), and various national regulations. Shipping rules are agreed and set by the IMO, the most important global institutional actor and decision-making forum for maritime transport. Most of the agreed regulations are ratified and integrated into national laws by the states around the Baltic Sea.

According to Article 5 of the EU directive on Maritime Spatial Planning, member states shall aim to contribute to the sustainable development of maritime transport in addition to other sectors. This means that maritime transport is seen as an important sector to be enhanced through MSP both nationally and in a cross-border context. Moreover, there is a need to properly link to the EU and especially the IMO-procedures, as these are an important steering mechanism beyond the national level.

Because of the many international agreements on shipping (including those relating to impacts of shipping – see environment in this chapter) there are few sector-specific objectives and goals on a regional and national level. Shipping is directly linked to land – through ports and harbours, different economic activities (industries) taking place on land and socioeconomic aspects (population intensity). This is the part where national regulations and management set in. Ports are important locations for the exchange of goods and passengers (with potential links to fisheries and offshore energy maintenance). For the transport sector to function optimally, the various modes of transport need to cooperate with each other. In order to improve the efficiency of the transport system, the interplay between shipping, road and rail transportation needs to be improved. This also means efficient planning on land.

Carrying out MSP, especially in a transboundary context, each country must consider these international agreements to achieve the set goals and secure safe navigation at sea. Shipping requires marine space in the form of shipping lanes and direct vessel routes in the coastal and open sea. During the MSP process, the requirements of the shipping industry need to be balanced nationally and internationally while respecting safety requirements, accessibility and environmental impacts.

Figure 4.4-1: Overview of important institutional actors and frameworks to manage shipping in the Central Baltic Sea

OVERALL	NAVIGATIONAL VESSEL AN STAFF SAFETY	POLLUTION

GLOBAL United Nations (UN)

UNCLOS

Objective: to define the states' rights and responsibilities, in the territorial sea, EEZ and the high seas.

IMO

CONVENTION ON THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA (COLREG)

Objective: sets navigation rules to be followed by ships and other vessels at sea to prevent collisions between two or more vessels.

INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA (SOLAS)

Objective: specify minimum standards for the construction, equipment and operation of ships, compatible with their safety.

INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS (MARPOL)

Objective: includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations. Baltic Sea as PSSA

EU

GUIDELINES FOR THE DEVELOPMENT OF THE TEN-T

Objective: redefines the Motorways of the Sea as the maritime dimension of the trans-European transport network, which shall contribute towards the achievement of a European maritime space without barriers.

MARITIME TRANSPORT STRATEGY 2018

Objective: long-term competitiveness of the EU shipping sector, enhancing its capacity to generate value and employment in the EU, both directly and indirectly, through the whole cluster of maritime industries.

BALTIC SEA - REGIONAL HELCOM MARITIME

BALTIC SEA CLEAN SHIPPING GUIDE

Objective: to identify and promote actions to limit sea-based pollution while ensuring safe navigation.

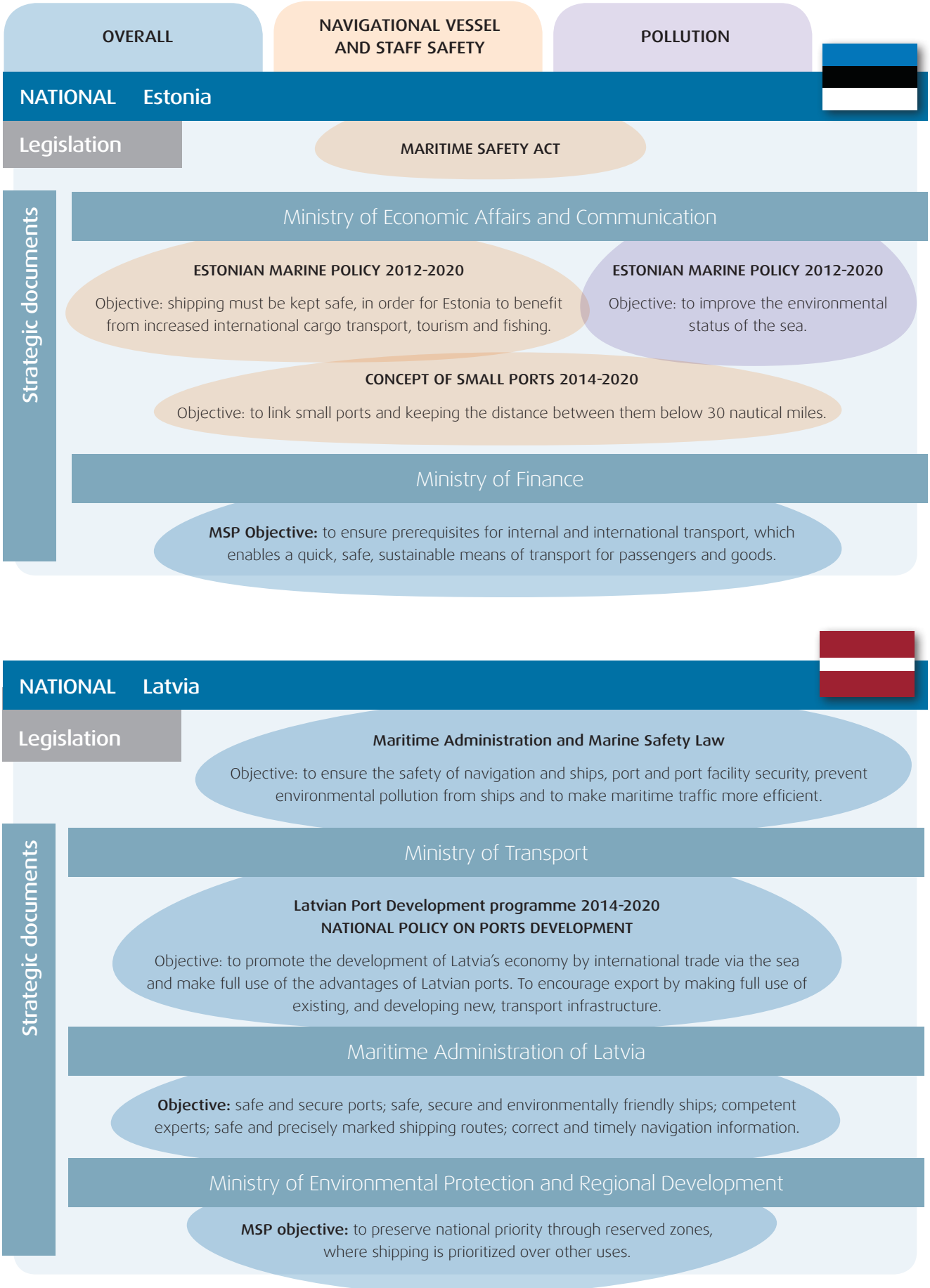
BALTIC SEA CLEAN SHIPPING GUIDE

Objective: to identify and promote actions to limit sea-based pollution while ensuring safe navigation.

VASAB

LONG-TERM PERSPECTIVE

Objective: to develop the Motorways of the Sea in the Baltic Sea region as a systemic solution to enhance the cross-border scale integration and a transfer of goods between the EU, the eastern neighbours, Central Asia and the Far East. Consider in the revised EU transport policy the extension of the Baltic Sea Motorways system to include further short-sea links between the EU ports, as well as connections from the EU ports to Kaliningrad and Saint Petersburg.


OVERALL
NAVIGATIONAL VESSEL AND STAFF SAFETY
POLLUTION
NATIONAL Estonia
Legislation
MARITIME SAFETY ACT
Strategic documents
Ministry of Economic Affairs and Communication
ESTONIAN MARINE POLICY 2012-2020
Objective: shipping must be kept safe, in order for Estonia to benefit from increased international cargo transport, tourism and fishing.
ESTONIAN MARINE POLICY 2012-2020
Objective: to improve the environmental status of the sea.
CONCEPT OF SMALL PORTS 2014-2020
Objective: to link small ports and keeping the distance between them below 30 nautical miles.
Ministry of Finance
MSP Objective: to ensure prerequisites for internal and international transport, which enables a quick, safe, sustainable means of transport for passengers and goods.
NATIONAL Latvia
Legislation
Maritime Administration and Marine Safety Law
Objective: to ensure the safety of navigation and ships, port and port facility security, prevent environmental pollution from ships and to make maritime traffic more efficient.
Strategic documents
Ministry of Transport
Latvian Port Development programme 2014-2020
NATIONAL POLICY ON PORTS DEVELOPMENT
Objective: to promote the development of Latvia's economy by international trade via the sea and make full use of the advantages of Latvian ports. To encourage export by making full use of existing, and developing new, transport infrastructure.
Maritime Administration of Latvia
Objective: safe and secure ports; safe, secure and environmentally friendly ships; competent experts; safe and precisely marked shipping routes; correct and timely navigation information.
Ministry of Environmental Protection and Regional Development
MSP objective: to preserve national priority through reserved zones, where shipping is prioritized over other uses.

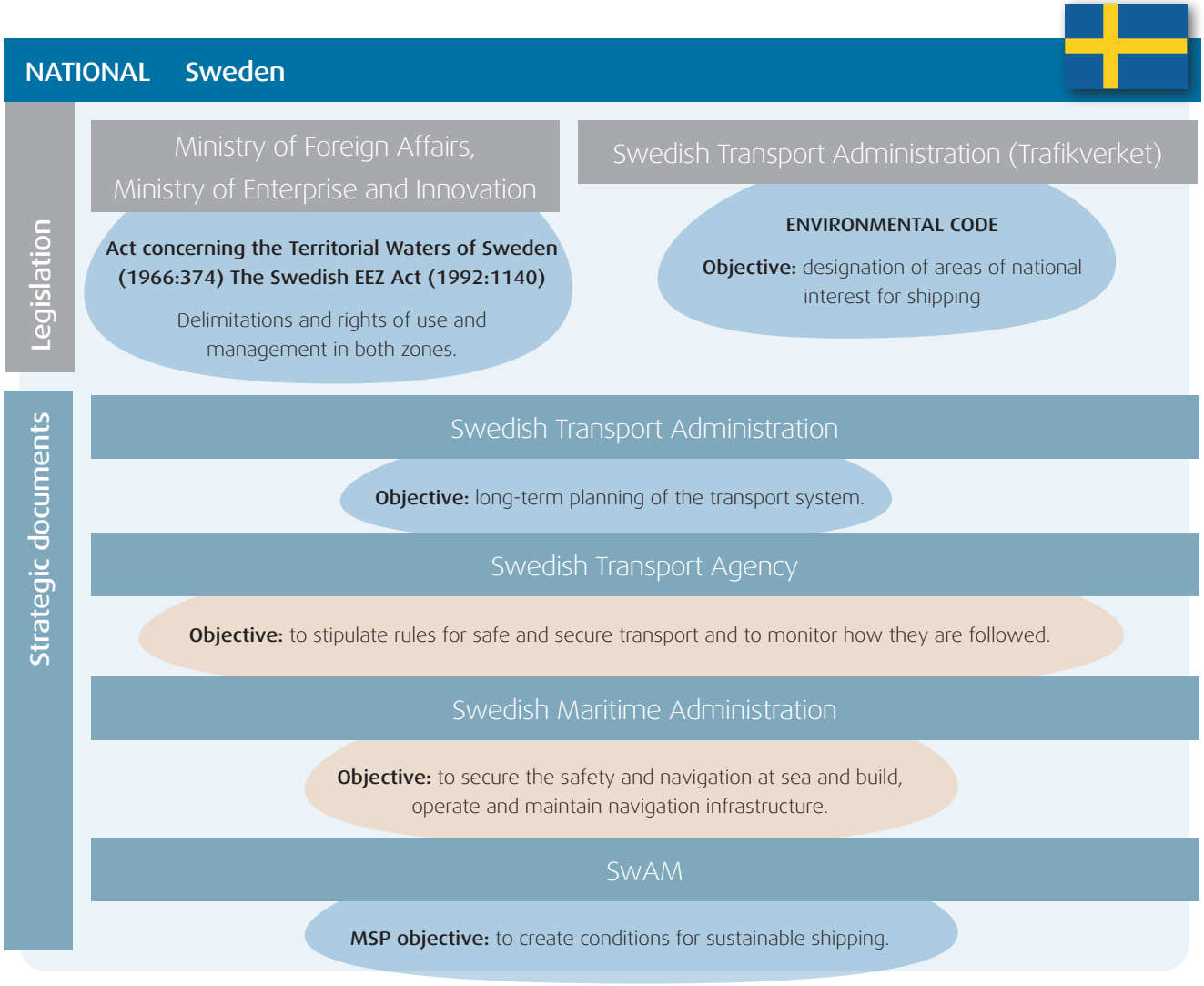


Figure 4.4-1: Overview of important institutional actors and frameworks to manage shipping in the Central Baltic Sea (Continued)

4.5. SECTORS' INSTITUTIONAL CHARACTERISTICS: OBSERVATIONS IMPORTANT FOR DEVELOPING TRANSBOUNDARY MSP IN THE CENTRAL BALTIC

Not unexpectedly, there are considerable institutional differences in how a sector is dealt with as such and through MSP. Different countries have different approaches on how management is organised within the country (distribution of responsibilities), different ways to prioritise and choose to include different sectors into MSP, not to mention the different priorities the countries give through either sector strategies or as MSP objectives.

A starting point for any kind of cross-border cooperation is to agree on definitions and approaches. If agreement is not possible, **it is important to understand the differences between countries.** It's not necessary to have exactly the same approach to deal with a specific sector, but the differences should be understood and acknowledged for effective cross-border cooperation.

In addition to institutional and procedural differences, either in specific sectors or MSP as a whole, countries also differ in the data and evidence used for making planning decisions. Hence, in addition to understanding the institutional differences, co-operating countries should also understand what kind of evidence and why that kind of evidence is using in the neighbouring country for making spatial decisions in its marine areas.

5. PLANNING EVIDENCE FOR MSP IN THE CENTRAL BALTIC

An important step in the project was to develop a combined picture on the status and trends of different sectors. Information on sector interests and needs was both necessary for discussions among planners (this chapter) and with stakeholders (next chapter). There is data available, but it is often not directly usable and possible to assemble across borders. Based on the shipping map developed early in the project, the group anticipated the development of other maps to be straightforward, e.g. for the environment. However, there are quite a few gaps and other challenges when trying to gather and harmonise data for the other sectors. Sometimes it was not just about data, but also about trying to reach an agreement across countries in the expert committees. Depending on the sector, data is collected by different actors, using alternating methods and different criteria and resolutions. The group has attempted to work around these challenges. The maps and the data tables in this chapter show how far the project has come in formulating new planning data and evidence, but further work data development is needed.

This section presents the Baltic SCOPE analysis on what types of data are relevant and needed to address specific sector- and cross-sector issues for MSP in the Central Baltic. The analysis includes information on the availability of specific sector data for each country involved in Baltic SCOPE (tables with a coloured legend). It also includes reflections on research needed to improve the knowledge base and priorities.

Planning evidence is understood here as **spatial and related data used for planning purposes.** This includes available maps and other types of data and information describing the present situation, as well as future developments and visions of a sector[40] in marine space and its functional connections across marine basins, including the shore/mainland.

According to the UNESCO definition[41], MSP is a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have been specified through a political process. To help facilitate sector discussion, the first task was mapping sector interests in the sea. Taking into account that all Central Baltic case study countries were still at an early phase of planning (identification), it took time to discuss data/information needs with sector stakeholders at home and then bring the knowledge back to the project expert groups.

In order to convert sector data into spatial data sets useful for MSP, every sector and topic group made a mapping effort assembling available existing national data sets into a Central Baltic area map. A second step was to discuss national approaches and methodologies in order to map national interests and to find similarities and differences and define possible future directions and tasks for the development of a shared view of the Central Baltic area. For example, the fisheries sector uses two types of data to identify sector interests – scientific (research done to identify spawning, nursery grounds and so on) and economic activity, including records from the Vessel Monitoring System (VMS), and Automatic Identification System (AIS), as well as traditional fishermen log books (on paper); the latter are traditionally converted to raster data explaining spatial and temporal distribution of fishing activity. For the energy sector, the main data sources are made up of existing constructions at sea (cables, OSW parks) and planned/priority areas for deployment of OSW energy. Areas designated for future OSW are based on certain criteria covering geomorphologic characteristics of the sea-bed, distance from onshore facilities and wind velocity maps. The shipping sector relies on AIS data sets and the environmental sector uses various research data covering habitat maps and marine environment quality indicators, according to MSFD classifications.

40 Planning evidence could also include agreed targets, trends and limitations/conditions for future sea use, but this is not addressed in this chapter.

41 See: http://www.ioc-unesco.org/index.php?option=com_content&view=article&id=147&Itemid=76.

For each sector a map is provided, combined with an overview table on currently available data, followed by a review of data needs and availability for the overall Central Baltic area according to individual countries. The different topic experts and spatial planners through group meetings (Āboltiņš et al. 2016, Aps et al. 2016, Kopti et al. 2016 and Ruskule et al. 2016) have developed this analysis. The data availability tables and legends have been formulated through sector expert discussions. The maps were designed by GIS experts by combining all available data layers provided by different institutions/sources and visualizing it by keeping in mind MSP relevance as the main criteria. The development of maps within the framework on planning evidence was an important exercise in understand and visualizing the different planning approaches of each country, and highlighting transboundary difficulties, but was not intended as an attempt to create common and perfectly coherent Central Baltic maps.

It is important to note that crucial planning evidence for different sectors is created differently. For example, data for the shipping sector is collected in a relatively consistent manner across borders, allowing for easier development of maps denoting shipping intensity (for results, see HELCOM 2016a), whereas criteria to designate areas for future use in MSP - differ between countries and do not meet properly at the borderline. Due to the complexity of the marine ecosystem, a wide range of environmental data sets are collected at a national as well as pan-Baltic (HELCOM) level, which are essential in the MSP process (e.g. for assessing species and habitat specific impacts of different sea uses, environmental conditions suitable for particular sea uses etc.). These data sets are often not complete or internationally comparable due to different methodologies applied. In order to support the transnational MSP process and to gain a quick overview on the distribution of ecologically sensitive areas, a consolidated map for the whole Baltic Sea could be developed, which would aggregate different data sets based on common methodology. For the energy sector, and OSW as an MSP newcomer, planned zones and visionary lines/directions exist together, but the greater overall pan-Baltic picture is lacking. Industry is in favour of long term scenario based approaches, but is still strongly dependent on national decisions and support, which are often short term. The fisheries sector map vividly shows differences in methods on how data is gathered at various national levels, but actual sector resources (spawning grounds) and fisheries interests are primarily in a transboundary nature.

The HELCOM-VASAB MSP Data Group was established in order to support data, information and evidence exchange for MSP processes in the Baltic Sea region, with regard to cross-border and trans-boundary planning issues. Although the MSP Data Group has been given an ambitious mandate, it still focuses on simplified approaches and smart end-solutions for MSP planners. The main outcome of the MSP Data Group work should be a guidance document for data availability and exchange in Baltic Sea region. This should ensure that the minimum list of input and output data for MSP is agreed between Baltic Sea region countries - discussions on exchange methods are currently underway.[42]

42 See http://www.vasab.org/index.php/maritime-spatial-planning/bsr-msp-data-esg.

5.1. ENVIRONMENT: AVAILABLE AND NEEDED PLANNING EVIDENCE

The marine environment and its status can be described by various data sets – including both physio-chemical conditions (bathymetry, water temperature, sediment types, salinity, nutrients, level of eutrophication and more) and biotic information on specific features of marine ecosystems. Depending on the planned activity, different environmental aspects are relevant, e.g. the sediment type is crucial for the location of infrastructure or mineral extraction, whereas aquaculture planning requires information on temperature, salinity and nutrients. Among the environmental values in MSP, the most essential data include the distribution of species[43] and habitats, areas of high concentration of ecological value and existing nature conservation interests.

According to the environmental topic group, the following data sets are essential for implementing an ecosystem-based approach in MSP, by respecting the spatial features and sensitive areas of the marine ecosystem in the planning process:

- MPA borders and zoning (if applied), including categories of protected areas (available at HELCOM), proposed areas and those to be investigated.
- Important Bird Areas – defined by internationally agreed criteria, data available for Estonia, Latvia and Sweden.[44]
- Information on bird distribution based on data from surveys and monitoring.
- Information on distribution of marine mammals.
- Information on the distribution of fish species based on data from scientific surveys and monitoring or catches of commercially important species (fishing logbooks).
- Fish spawning and nursery areas: note that accuracy and mapping methodology currently differs between countries.
- Benthic habitat maps – mapping based on field survey data covers only some parts of marine waters. Different approaches for the identification of benthic habitat types by extrapolation through modelling, based on bathymetry and geology, exist. Possibilities of application of the HELCOM HUB[45] classification system for mapping of benthic habitats -need to be discussed.
- Mapping of ecologically valuable/sensitive areas: note that there are different approaches to calculating value and sensitivity, applied in the countries resulting in a need to harmonise the input data sets and methodology for data aggregation in order to develop a common/standardised Pan-Baltic map, applicable in a transnational MSP context for better coherence.
- Mapping of ecosystem services: different approaches (depending on data availability) and classification systems can be applied. Baltic SCOPE suggests using the Common International Classification of Ecosystem Services (CICES)[46] for ensuring international comparability and coherence.

Benthic habitat mapping makes a core data set for identifying ecologically valuable areas, mapping ecosystem services and assessing spatial impacts of sea uses. There is a need for a cross border collaboration to harmonise approaches of benthic habitat mapping, including the exchange of geological maps, a joint identification of the habitat types and addressing of the connectivity issue. Harmonised data sets and common benthic habitat maps provide a better knowledge base and support transboundary coordination and impact assessment.

Ecosystem service mapping is an important step when implementing an ecosystem-based

43 For a relevant Red List on species, see HELCOM (2013a)

44 An Important Bird and Biodiversity Area (IBA) is an area identified using an internationally agreed set of criteria as being globally important for the conservation of bird populations. The program was developed and sites are identified by BirdLife International.

45 For details see information on the website: http://www.helcom.fi/baltic-sea-trends/biodiversity/helcom-hub and HELCOM (2013c).

46 For details see information on the website: www.cices.eu.

approach in MSP. It helps to assess trade-offs between ecological and socio-economic benefits and assists decision-making on spatial allocation for different sea uses. Possible approaches for ecosystem service mapping need to be discussed further. The Latvian example (see below Latvia: Available and needed environmental planning evidence) could be used as a starting point for further development.

The overall coherence and connectivity of the Natura 2000 and the BSPA network should be assessed from a transboundary perspective. For this purpose a standardised map of ecological values needs to be developed, preferably for the whole Baltic Sea. Such a map could provide an evidence base for selecting areas to be included in the MPA network, forming of "blue corridors"[47] within MSP, as well as for the identification of conflict areas with various uses of the sea and the best locations for specific development projects (e.g. wind farms, cables, mineral extraction, aquaculture farms, etc.) to avoid adverse impact on the most sensitive areas of the marine ecosystem.

Two indicative environmental values maps have been developed in the project through the environmental topic group (see Figs. 5.1-1 and 5.1-2). They are a first attempt to assemble existing data to show the core areas of interest in the Central Baltic for preserving the overall marine ecosystem.

The map on Existing protection schemes and fish spawning grounds Fig 5.1-1 includes areas designated or assessed as important for protection of certain species and habitats, including existing MPAs (Natura 2000 sites and HELCOM MPAs), Ramsar Sites[48], Important Bird Areas, areas important for fish spawning as well as proposed areas for new MPAs (Sweden) and investigation areas for potential new MPAs (Latvia). This map can be seen as the first transboundary planning evidence for MSP in the Central Baltic. It indicates both existing protection but also shows where some further key values are located, that might need protection. Both MPAs as well as IBAs and Ramsar sites are defined based on internationally agreed criteria, thus representing harmonized data sets, and setting conditions for MSP. However, for the fish spawning areas a harmonization in mapping approaches would be needed.

The second map on ecological values (Fig 5.1-2) implied more processing and synthesis and includes data on the following environmental features:

- Habitat mapping (using EBHAB / HELCOM HUB classification system) for all CB countries;
- Distribution of bird species for all CB countries;
- Distribution of fish species (or total fish catch) for Latvia and Sweden;
- Distribution of marine mammals for Sweden and Estonia.

The map is aggregated from separate data layers on habitats, birds, fish and seals, as well as already aggregated data layers of ecological value or sensitivity of marine areas. The environmental value of the areas is presented on a relative scale ranging from 0 to 100. With the separate data layers, first the minimum and maximum values of each layer were transformed to a scale between 0 and 100 and then averaged to get an overall environmental value. In the cases of an already aggregated input layer of the ecologically valuable or sensitive areas, the aggregated value was transformed to the same 0-100 scale, therefore, improving the data comparability between the countries. It is important to note that this is a draft version of a map and does not yet constitute planning evidence. The map includes already aggregated data layers developed using different methodologies; the included data sets are not harmonised. In order to develop a methodologically harmonised map, the initial data sets on the distribution of significant ecological features (habitats, birds, fish, and marine mammals) need to be compiled and ecological values assessed using a common methodology.

47 A blue corridor can be considered as a channel or a route of particular importance for the population exchange between locations and of importance for the maintenance of bio-geographical patterns of species and communities (Source: BALANCE Interim Report No. 4 http://balance-eu.org/xpdf/balance-interim-report-no-4.pdf).

48 A Ramsar Site is a wetland site designated as being of international importance under the Ramsar Convention. The Convention on Wetlands, known as the Ramsar Convention, is an intergovernmental environmental treaty established in 1971 by UNESCO, and coming into force in 1975.

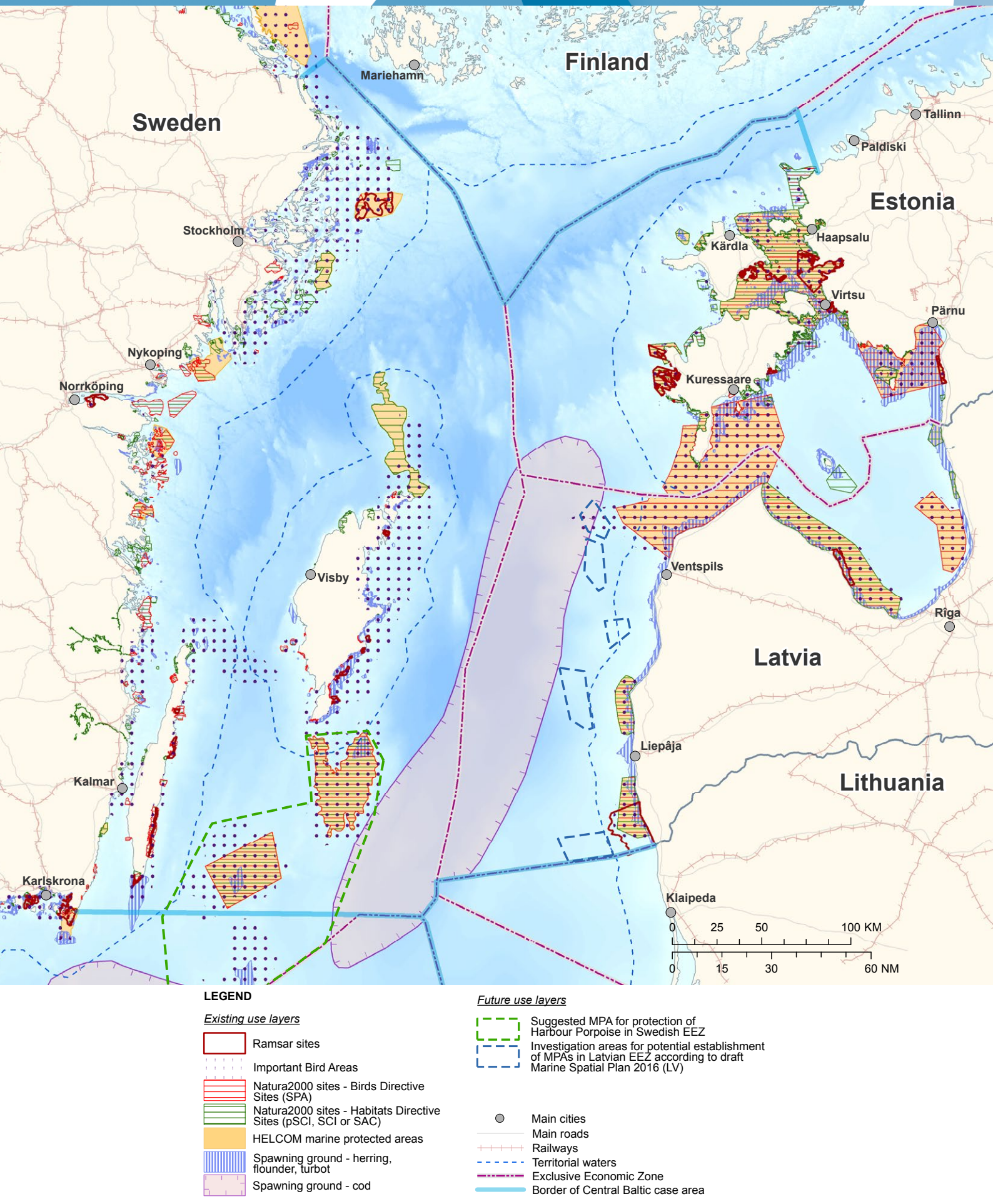
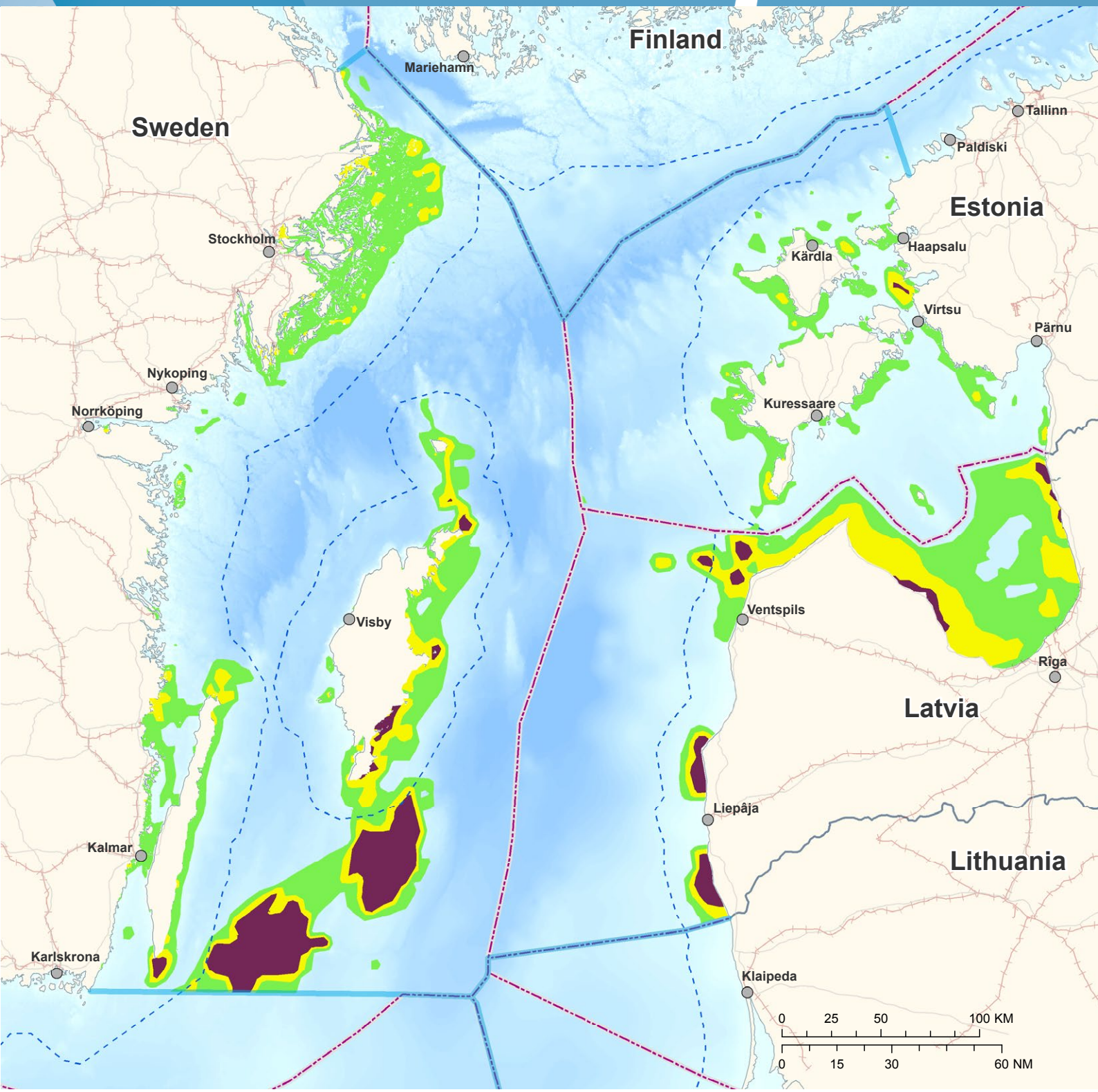


Figure 5.1-1: Core interest areas for marine ecosystem preservation: existing protection schemes and fish spawning grounds.



LEGEND

Environmental value*

- 25
- 50
- 75
- 100

- Main cities
- Main roads
- Railways
- Territorial waters
- Exclusive Economic Zone
- Border of Central Baltic case area

* Map indicates the areas of high ecological value, identified by aggregation of different data sets on distribution of benthic habitats, birds, fish and seals and assessed in relative scale between 0 and 100 (0 means least environmental value and 100 means the highest value). Map is based on existing knowledge, which differs between countries, and because of choice of criteria. This map is a test of how environmental value and green infrastructure can be visualized and what kind of harmonization is needed

Figure 5.1-2: Core interest areas for marine ecosystem preservation: ecological values

Table 5.1-1 provides an overview on the availability of planning data from a marine environmental perspective. As can be seen from the table, in areas based on international agreements (c.f. Marine Protected Areas and environmental data sets), the availability of data is more or less complete and comparable across nations, whereas some important data is not available (c.f. bird migration routes). Furthermore, even if data are available, such as aggregated data sets on areas of high ecological value/sensitivity, the methodologies behind the data still differ between countries.

Table 5.1-1: Availability of Planning Evidence on the Environment in the Central Baltic area

Legend

Available
Not available
Not available/not specified
Partly available/under development

Spatial data layers	ESTONIA	LATVIA	SWEDEN
MARINE PROTECTED AREAS INCLUDING:			
Natura 2000 areas			
HELCCOM MPAs (former BSPAs)			
Important Bird Areas (BirdLife)			
Ramsar sites			
UNESCO Biosphere Reserve			
Areas proposed for MPA designation			
Investigation areas for MPA designation			
DATA ON SPECIES AND HABITAT DISTRIBUTION			
Benthic habitats	The key habitats and necessary blue corridors between them.	HELCOM HUB classification system; based on a sediment map and bathymetry data; field observations/mapping only for limited areas.	
Bird distribution (wintering areas, concentration areas during migration period and summer, moulting areas)		In EEZ only one winter monitoring data source; better data coverage for the Gulf of Riga, Irbe Strait and coastal areas.	
Bird migration routes			
Fish species distribution Sprat, herring			
Fish species distribution Cod, flounder			
Fish spawning and nursery areas	Only Baltic herring.	Spatial research data available on sprat spawn production; spawning areas of cod, flounder and herring based on theoretical data.	
Seal distribution		Only HELCOM data.	
OTHER ENVIRONMENTAL DATA SETS:			
Sea bottom sediments			
Bathymetry			
Water salinity distribution			
Water transparency (Secchi depth)			
Aggregated data sets:			
Areas of high ecological value/sensitivity			
Ecosystem service assessment maps		• Mapping based on empirical data: provisioning services (total catch of fish; distribution of red algae beds); cultural services (areas suitable for tourism and leisure). • Mapping based on expert opinion: regulating services.	

Below, the situation is specified for the three Central Baltic countries, providing some extra information on interesting recent initiatives of the three countries, which might present broader relevance.

5.1.1. Estonia: Available and Needed Environmental Planning Evidence

Estonia is currently collecting necessary data for MSP, but has not yet analysed or applied it in MSP. The Estonian Ministry of Finance has ordered several analyses to gather different environmental data, which is needed for MSP, including migration areas for bats and migration corridors for birds. The available environmental data includes MSFD indicators.

Based on the requirement of the MSP Directive on the application of the ecosystem-based approach to the management of human activities, as it is defined by MSFD, the Estonian approach to MSP involves an assessment of potential sea use options (scenarios) with regard to their impacts on the environment. An integrated marine monitoring programme targeting the reporting recommendations on MSFD Article 11 has been compiled, and relevant indicators of all descriptors have been established[49]. The MSFD indicators provide knowledge on the environmental status in the MSP area, as well as indicating environmental changes attributed to the MSP process. The latter feedback (especially if some of MSFD indicators could be spatially addressed/mapped in future) can guide the MSP process in order to achieve effective spatial planning for sustainable development. To date, however, no official document exists that explicitly formulates an ecosystem-based approach for Estonian MSP, and no direct linkage is established for the integration of the MSFD and MSP processes. [50]

There is a need to collect and model seamless data on the spatiotemporal patterns of key environmental variables (biotic and abiotic; inside and outside of MPAs) and sea uses, and to assess how existing pressures, such as eutrophication, pollution, underwater construction and climate change, separately or interactively influence the marine environment.

5.1.2. Latvia: Available and Needed Environmental Planning Evidence

Mapping of areas of high ecological value

The Latvian Institute of Aquatic Ecology (LIAE) has developed a map of ecological values, which combines available spatial data sets on the distribution of benthic habitats, algae, birds and fish species (Fig. 5.1-3). The map is developed by summarising information according to the following selected criteria:

- Biodiversity (number of species, coverage of biologically significant species);
- Aggregation (areas important for birds and fish species);
- Naturalness (presence of invasive species);
- Proportional significance (coverage of benthic habitats).

The mapping results need to be interpreted with caution as the limited coverage of field surveys causes high levels of uncertainty. The level of certainty was estimated based on the number of ecological categories evaluated in a particular grid cell (Fig. 5.1-4).

49 In Estonian, available at http://www.envir.ee/sites/default/files/mereseire_programm_10092014.pdf.

50 See Ruskule et al. (2016).

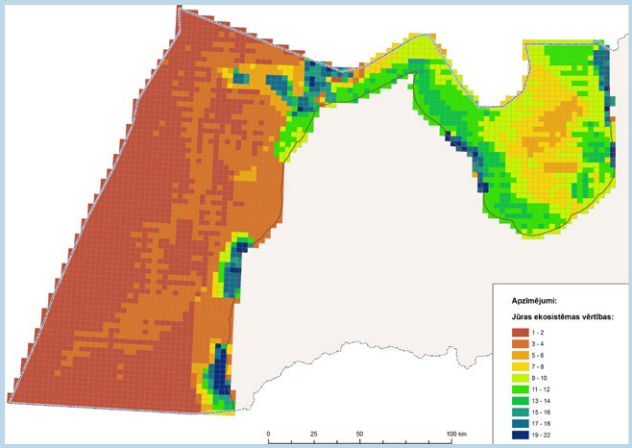


Figure 5.1-3: Sum of ecosystem values estimated by different criteria. Legend: ecosystem value from low (red) to very high (dark blue); (LIAE 2015)

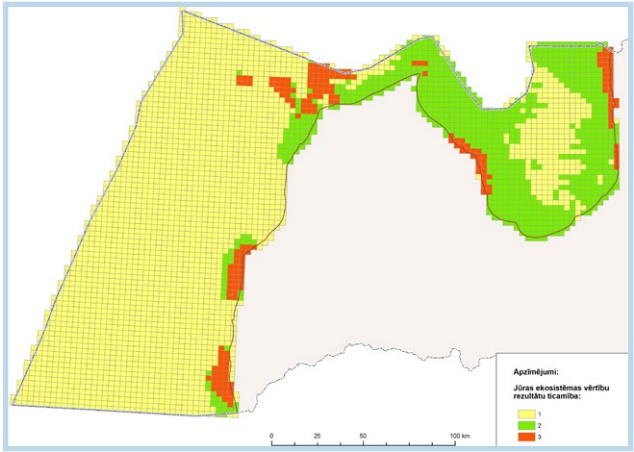


Figure 5.1-4: Certainty of estimation results. Legend: level of certainty - low (yellow); medium (green); high (red); (LIAE 2015).

The above aggregated information on ecological values in Latvian marine waters was used as input to the common map of ecologically valuable areas (Figs. 5.1-1 and 2).

Mapping of ecosystem services

Biophysical mapping of ecosystem services was performed using available spatial data sets and hypothetical assessments based on expert knowledge. The ecosystem service maps were used to assess the impacts of the MSP scenarios and proposed solutions for the permitted use of the sea. Characterisation of ecosystem services was based on the CICES v 4.3 (2013)[51] classification system proposed by the EC MAES working group[52], where ecosystem services are considered in three categories – regulation and maintenance, provisioning, and cultural services. The regulation and maintenance services were mapped using the benthic habitat map. The ecosystem services within each habitat type were assessed based on expert knowledge using the habitat types as proxy for the distribution of the ecosystem service. Assessment in relative scale was not possible at this stage, due to the lack of relevant research data from Latvian marine waters. A quantitative approach was applied for mapping provisioning and cultural services, using statistical and field data. Provisioning services were mapped in two different maps – fish for food and algae and their outputs. Total catch of commercially important fish can be transferred in real economic outputs, while the red algae Furcellaria lumbricalis beds were mapped as a potential resource, which can be used in food industry, pharmacy, microbiology, etc. In the category cultural services the physical and experiential interactions were assessed in relation to possibilities for coastal marine tourism and leisure activities, using a combination of several criteria: number of visitors; suitability of the area for particular tourism or leisure activity and accessibility.

5.1.3. Sweden: Available and Needed Environmental Planning Evidence

Sweden developed its environmental planning evidence in 3 steps. Early during MSP-preparation in Sweden, a need for aggregated spatial data on ecosystem values in the marine environment was identified. At that time, the concept of green infrastructure was in focus at the government level, fitting well with needs for environmental data in MSP. A green infrastructure perspective addresses the need to see ecosystems from a landscape perspective, rather than merely focusing on MPAs and the most rare or threatened species and habitats. Since then, SwAM has developed three different national maps/data sets on green infrastructure to be used in MSP. The first map (Fig 5.1-5) from 2013 was based on protected areas and regulations, as well as other data relating to marine natural values. The map gives an indication of areas of particularly high nature value; the depicted picture is, however, not complete.

51 Common International Classification of Ecosystem Services: http://cices.eu/.

52 MAES - Mapping and Assessment of Ecosystems and their Services, EC working group for implementation of Task 5 of the EU Biodiversity Strategy 2020.

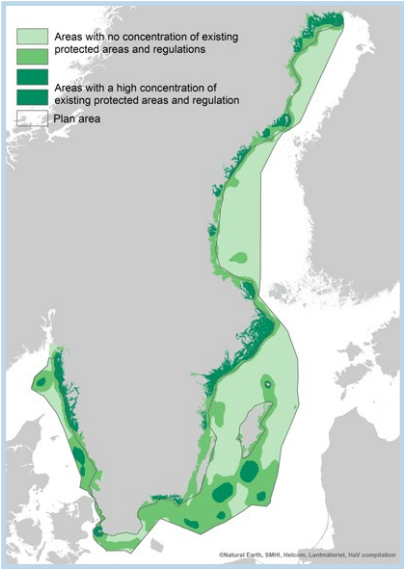


Figure 5.1-5: Green Map from 2013 published in the MSP Current Status Report 2014 (SwAM 2015).

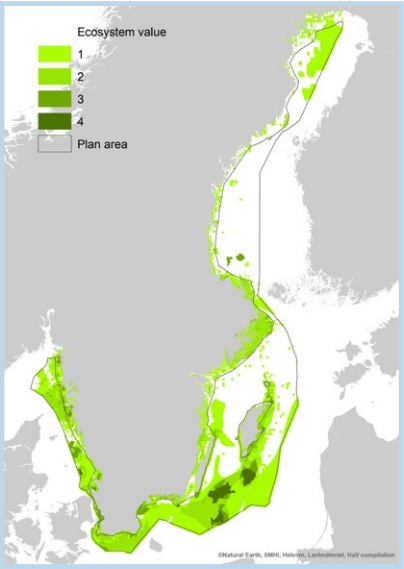


Figure 5.1-6: Green Map used in the first draft of Swedish marine spatial plans. Legend: dark green signifies higher values; (Wijkman & Enhus 2015).

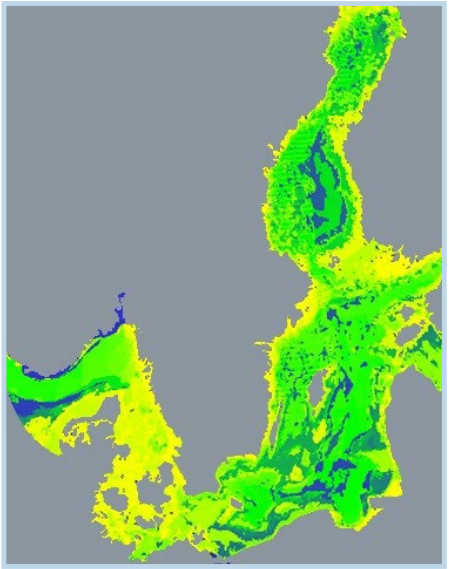


Figure 5.1-7: Symphony Ecosystem sensitivity map draft from 2016

Realising that better evidence was needed, in 2015 SwAM had consultants develop a new green map based on four ecosystem component layers: benthic environment, fish, marine mammals and birds (Fig 5.1-6). The map is based on national data of mapped nature values. Rough spatial modelling and predictions were carried out for environmental values where such national data were missing. The map has a grid size of 500 meters. Even though this map also has its limitations, it played an important role in developing the first draft for Swedish marine spatial plans.

The next challenge was to link marine activities and pressures to the green infrastructure (indicating marine use/value hotspots). For this purpose, Symphony was developed – an analytical tool to estimate cumulative environmental impacts in MSP. It allows the early identification of areas of concern, so mitigate planning options can be considered. Symphony is based on international methods for cumulative assessments. Planning evidence for the environment is gathered as input. Data was synthesized by nine collaborating partners for 24 pressures, 25 ecosystem components and background data (depth, coastline, water parameters). Symphony was set up in 2016 and will be used in Swedish MSP from 2017. It should allow for both a better presentation of green infrastructure as well as for analysing cumulative human impacts on green infrastructure (e.g. see fig.5.1-7)[53].

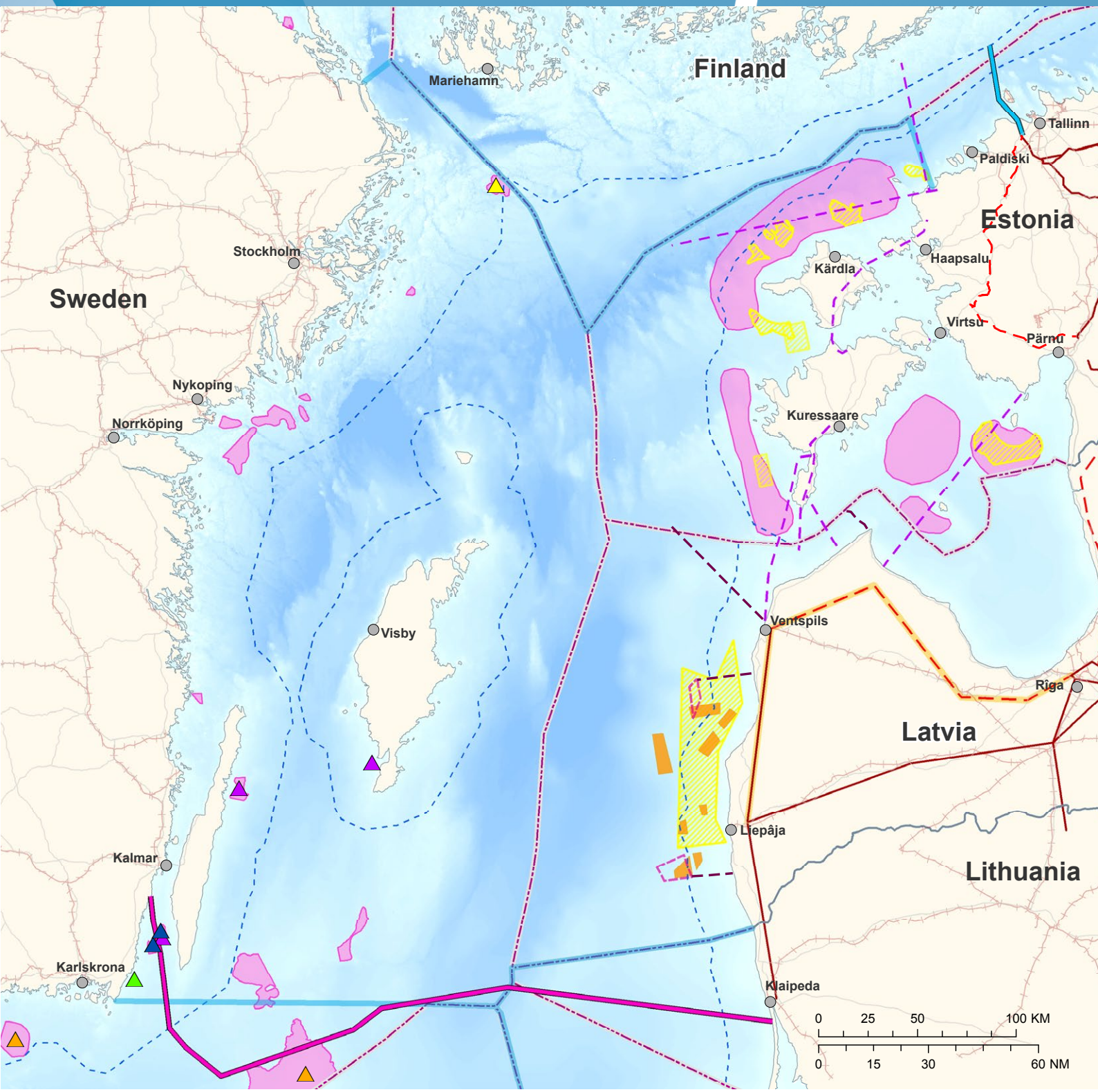
53 Symphony is a tool, but was developed as a project by SwAM. There is no project webpage and a tool description is available here: http://msp-platform.eu/practices/symphony-tool-estimate-cumulative-impacts . See also Ruskule et al. (2016), p. 37.

5.2. ENERGY: AVAILABLE AND NEEDED PLANNING EVIDENCE

In the interaction between development planning of the energy sector and MSP, the accumulation of the sector's planning evidence constitutes a challenge in itself. This was both the conclusion of stakeholder and the planners' meetings in Riga and Tallinn. It is both related to the interest of the sector to get engaged in MSP and to its dynamics. As energy security is high on the policy agenda, providing a relatively privileged status, planning in the energy sector tends to proceed in its own pace and channels rather than getting involved in MSP ahead of time. Moreover, drawing a comprehensive map visualizing both past, present and future projects and plans in the energy sector presents challenges related to the dynamics of the sector. These are determined by various factors such as available technological solutions, regulatory frameworks, market signals (e.g. the cost of primary energy resources and of producing energy in general), the availability of financing and, not least, factors influencing the demand for specific types of energy and conflicting sector interests, such as defence and environment.

The map developed by the energy expert group (Fig.5.2-1) consolidates information available from public sources and stakeholders (state institutions, energy industry, professional associations). It provides a snapshot of the current situation (November 2016) in a rapidly developing sector, visualizing existing infrastructure objects, approved plans for upgrading and expanding transmission networks, tentative areas for the deployment of OSW facilities, as well as possible areas for constructing linear infrastructure and OSW facilities in the longer term. The map shows layers for the three most relevant types of information on OSW: a) existing and potential linear infrastructure objects or their envisioned directions – power cables and overhead lines, both offshore and onshore; b) existing and initiated (under investigation and/or with permissions) energy production infrastructure objects – OSW facilities and c) areas identified as technically and commercially suitable for constructing linear infrastructure or deploying energy production infrastructure – new subsea power cables, and OSW.

The Central Baltic study illustrated that information, although mostly available, is scattered among various stakeholders and effort is needed to get a full picture of what is happening and what the future plans of different stakeholders are. For an overview on the data situation, see also Table 5.2-1.



LEGEND

Existing use layers

- Existing overhead electricity lines (LV; EE)
- "Kurzemes loks" (LV)
- Permit areas for the investigation of conditions and the exploration of wind power (LV)

2016 status of sea-based wind power (SE):

- Application
- Being dismantled
- All permissions in place
- Running
- Investigation before application

Existing underwater power cables:

- EstLink1 (EE-FI)
- Nordbalt Cable (SE-LT)

Future use layers

- Ongoing grid expansion until 2020 (LV; EE)
- Perspective electricity cables according to draft Marine Spatial Plan 2016 (LV)
- Visioned perspective power lines/ directions (LV; EE)/ NP EE2030 Energy line (EE)
- Suitable areas for wind park development according to draft Marine Spatial Plan 2016 (LV)
- Areas of interest for developing off-shore wind facilities (LV; EE)
- Areas of national interest for seabased wind power (SE, EE)

- Main cities
- Main roads
- Railways
- Territorial waters
- Exclusive Economic Zone
- Border of Central Baltic case area

Figure 5.2-1: Available planning evidence on energy in the Central Baltic Sea

The following points summarise the situation with the available and required data, which composes planning evidence:

Existing uses / activities:

- OSW farms: under construction, operational or being dismantled.
- Power cables: data available, and Transmission System Operators (TSOs) can provide the necessary information on capacity (as well as a layer of the complete map[54] of the transmission system).
- TSOs can also outline the future development of the energy portfolio as changes are being planned or are already taking place with certain technologies getting phased out, replaced/upgraded, or introduced.

Future use layers / Development intentions, planned activities and investments:

- OSW farms (incl. areas of national interest for sea-based wind power) and cables – data ranges from very vague indications to specific calculations by particular commercial enterprises planning deployment of OSW facilities.
- Indicated potential OSW areas do not necessarily mean to be representing marine space where OSW will definitely be deployed. These areas often represent the ideal place from the perspective of OSW developers, but have limited feasibility from the perspective of authorities and institutions.

Abandoned plans for OSW farms (Estonia and possibly elsewhere):

- OSW development does not necessarily take place and initial plans may change including an option of completely abandoning plans to build OSW facilities in particular places at sea.

Scheme of possible connections to the onshore grid, power sub-stations and grid capacity:

- This data is usually available from the national TSOs and Distribution System Operators (DSOs) as no new power production capacities can be connected to the grid without prior coordination of the issue.

Physical conditions:

- This includes various types of natural science and use data such as meteorology, bathymetry, ice (Gulf Of Riga as a resource for wind energy (GORWIND)[55] project results for the Riga Gulf), Biological data (spawning grounds), ecosystems (Natura 2000, MPAs, HELCOM marine protected areas, Ramsar sites), military exercise areas / defence interests.

54 See https://www.entsoe.eu/map/Pages/default.aspx or http://www.svk.se/en/national-grid/map/.

55 For details see information available in national language on the website: http://www.modlab.lv/lv/gorwind.php .

Industry information:

- Energy producers as well as infrastructure operators [can] share the information, including data on future development plans, as long as it is not commercially sensitive.

Societal dimensions:

- Discussions with relevant stakeholders (particularly with the companies responsible for national energy infrastructure development – transmission system operators and the biggest producers of power and heat) and in-depth analysis on trends in the energy sector might be needed to expand the relevant information.
- Studies on general public / local communities' (coastal residents in particular) opinion can add to the overall context for effective and optimal use of marine space.

Ten Year electricity (and gas) Network Development Plans (TYNDP) [56] are another relevant source of information for MSP, especially in the context of developing new electricity or natural gas interconnections. TYNDP are part of a compulsory procedure that network operators for electricity and gas have to go through in order to get co-financed from the EU funds (Connecting Europe Facility or CEF).

Additionally required planning evidence might be **criteria for the possible visual impact[57] of OSW farms on coastal landscapes.**

It is important to note the different approaches to planning the energy sector has in comparison to other sectors, in particular in the context of MSP. The energy sector approaches planning from the perspective of energy security, primarily from the obligation of energy system operators to ensure an uninterrupted supply of energy to the consumers. As a result, the energy sector will be planning its development regardless of other sectors' interests, allowing the adjustment of plans as energy infrastructure projects proceed through particular stages of development.

As can be seen in the aforementioned and the availability table below, there are still considerable data gaps since the actual absence of objects. Yet the main spatial information available for the energy sector development in marine areas is qualitative data on the most suitable physical conditions, which is partially available in all three Central Baltic countries and is fundamental for decisions on the designation of prioritized areas for offshore energy deployment (see Fig. 5.2-1 Areas suitable for OSW energy deployment).

56 For details see: https://www.entsoe.eu/major-projects/ten-year-network-development-plan/tyndp-2014/Pages/default.aspx .

57 Backer & Frias (2013), p. 68 at Planning the Bothnian sea Outcome of Plan Bothnia - a transboundary Maritime Spatial Planning pilot in the Bothnian Sea (Digital edition 2013) http://helcom.fi/Lists/Publications/Planning%20the%20Bothnian%20Sea.pdf.

Table 5.2-1: Availability of Planning Evidence on Energy in the Central Baltic Area

Legend

Available
Not available
Not available/not specified
Partly available/under development

Spatial data layers	ESTONIA	LATVIA	SWEDEN
EXISTING ACTIVITIES			
OSW farms: under construction			
OSW farms: operating			
Power cables			
Thermal energy		Salacgrīva	
Pipelines			
FUTURE USE LAYERS / DEVELOPMENT INTENTIONS, PLANNED ACTIVITIES AND INVESTMENTS			
Investigation areas[58] for OSW energy deployment			
Areas suitable[59] for OSW energy deployment			
Areas suitable for wave energy deployment			
Underwater power cables and/or corridors			
Scheme of possible connections to the onshore grid and grid capacity		In Marine Spatial Plan	
Onshore grid expansion			
Pipelines			

5.2.1. Estonia: Available and Needed Planning Evidence on Energy

As OSW energy is one of the most important new interests in Estonian marine areas, crucial information for planning decisions within Estonian MSP consists of: meteorological data, information on natural and artificial seabed conditions/features, MPAs (including an on-going inventory), onshore infrastructure and most essentially, available wind resources. For the latter, several sources will be considered:

- Models for energy content at the height of 103m in Estonian coastal areas;
- Long-term wind speed in 3hr intervals until 2003 and in 1hr intervals since 2003 (needs further modelling);
- GORWIND project results[60]
- BaltAn65+ database[61] for the period 1965-2005 for wind speed and direction, 6hr interval, 11km resolution.

On-going research on bird migration corridors, feeding grounds and ice conditions will enrich

58 Investigation areas: where formal procedures have taken place or are currently taking place. The area has not only been identified by the industry or authorities as technically suitable, but further research under way by either industry or authorities

59 Suitable areas are areas that are technically suitable for OSW deployment as they correspond with certain criteria.

60 Estonia-Latvia crossborder project "GORWIND – Gulf Of Riga as a resource for WIND energy". Gorwind project results are not available on the website anymore but through its partner, the Tallinn University of Technology. The website is a mirror site: http://www.modlab.lv/lv/gorwind_eng.php.

61 Luhamaa A, Kimmel K, Männik A, Rõõm R (2011) High resolution re-analysis for the Baltic Sea region during 1965–2005 period.

existing planning evidence. Additional information is needed on wave energy and the specifics of coastal surveillance radars.

5.2.2. Latvia: Available and Needed Planning Evidence on Energy

In defining suitable areas for OSW facilities within the Latvian MSP process, the following criteria were considered:

- Average annual wind speed at the height of 100 meters equals 7.5-8.5 mps;
- Sea depth average: 30 meters;
- Preferably homogenous sea bottom;
- Connection to an onshore grid and its sub-stations proposed with the consideration to connect to the Kurzemes loks power transmission network section;
- International regulation requirements for safety zones for installing structures shall be met and shall not exceed a distance of 500 metres around OSW facilities;
- Visual impact on the landscape, mainly as seen from the coastline;
- Exclusion of priority areas for shipping, protection zones for surveillance towers, military training areas, port roadstead areas, sites for the disposal of dredged material, MPAs, investigation areas for potential establishment of MPAs;
- Potential coherence with other sea uses.

Suitable territories in Latvian MSP are based on the best available information on conditions for the deployment of OSW facilities, as well as on information on shipping routes, fishing areas, areas of environmental protection and other relevant information that can minimize the possibility of conflicts between the OSW farm developers and other sectors' interests.

5.2.3. Sweden: Available and Needed Planning Evidence on Energy

At the end of 2013 there were 91 wind turbines located at sea with a combined effect of 210MW. In 2013, the Swedish Energy Agency detailed the areas of national interest for energy production and energy distribution. 27 areas with a total area of approximately 4,000km2 were highlighted as areas of national interest[62] for wind power at sea. Criteria for the highlighted areas were: wind speed of at least 8mps, a connected area of at least 15km2 and sea depth of at most 35 metres. However, with regard to energy in MSP, there is a need for more planning evidence, such as analyses of future development of offshore energy technologies and improved GIS-layers.

5.3. FISHERIES: AVAILABLE AND NEEDED PLANNING EVIDENCE

Planning evidence for displaying fisheries interests include both spatial data on essential habitats for species of interest to fisheries (e.g. spawning and nursery areas) and on fishing activities and fishing infrastructure (e.g. harbours) – see Figures 5.3-1 Fishing activity and 5.3-2 Habitats. Table 5.3-1 provides an overview on the availability of identified types of data for each of the Central Baltic countries. The most interesting aspect is the lack of information on the distribution of national fisheries in pan-Baltic maps and the partial availability of data on important areas for national fisheries outside a country's own EEZ, such as spatial data, which would be important in transboundary consultations and for eventual decisions within MSP. For country specific details, see below.

62 Designated areas of national interest for sea-based wind power according to Chapter 4 of the Environmental Code (SFS 1998:808). For more recent (developing) planning evidence, see also SwAM (2016a).

Different data has been used for national maps and the main differences identified in the topic paper (Aps et al. 2016) are as follows:

- Different transboundary information;
- Difference in period of time (e.g. see time periods in Fig.5.3-1 Pelagic trawl fishery for each country);
- Difference in gear type;
- Differences in sample of important landing places;
- Difference in species presented in fish habitats.

Activity data

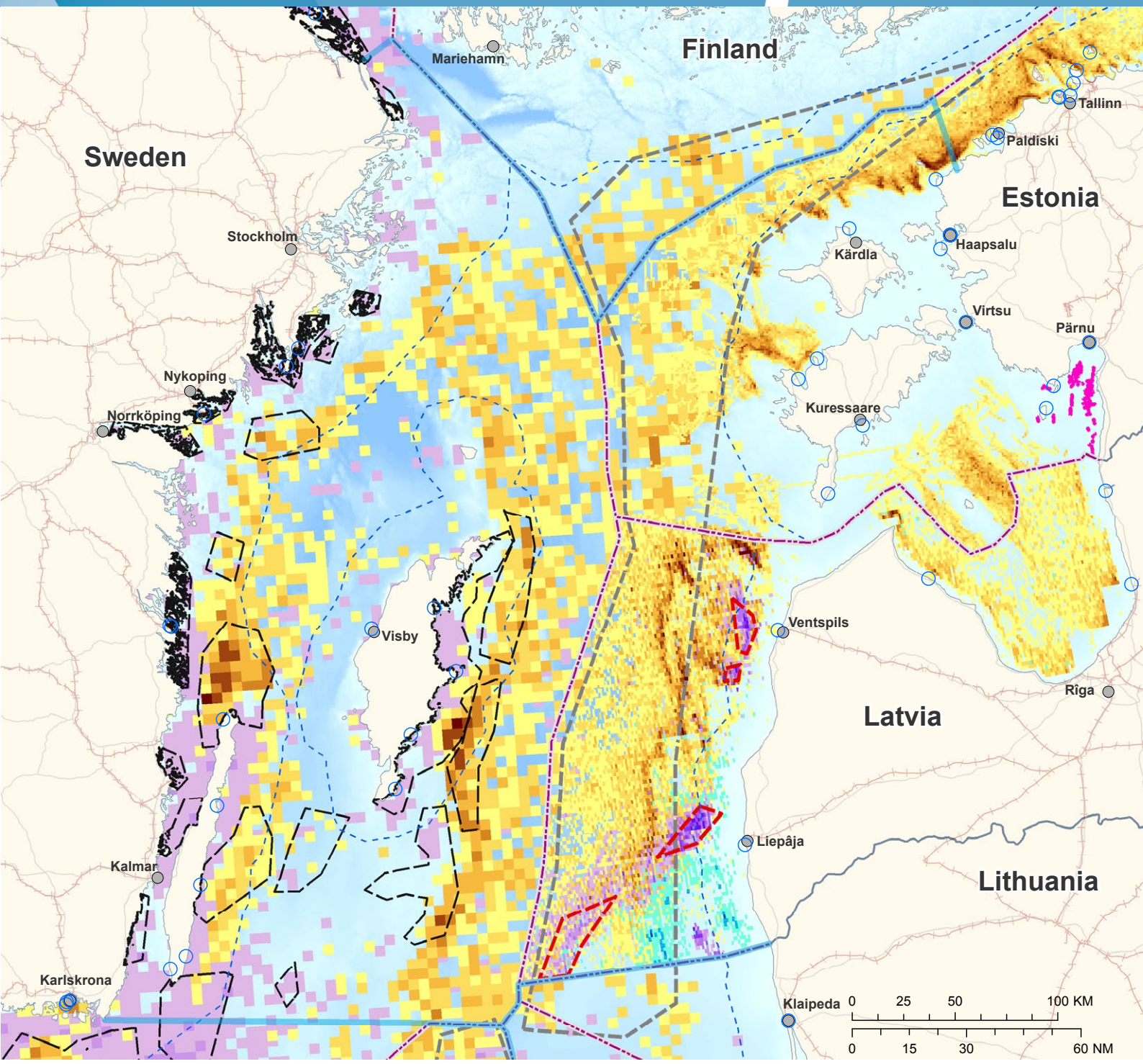
In relation to the data on activities, sample data is available on the geographical distribution of fisheries, which is more or less detailed depending on vessel size and the differences in spatial precision of the various Electronic Logbook Systems used by the countries in the Central Baltic area. Data collection in the fisheries sector is constructed to serve national agencies and their surveillance of the national fleet, to keep catch activities within the national share of the fishing quota. As a result of this national focus, there are limitations regarding spatial distribution of national fishing activities at regional or sub-regional levels, as well as differences regarding the geographical precision that the countries' separate logbook systems enable.

The ICES Working Group on Spatial Fisheries Data has data from all member states regarding total catch and landing weights for the Baltic Sea, structured in zones of 3x3 nautical miles[63]. In accordance to ICES agreements, this material is not published to a broader public without the permission from the member states. For transboundary issues in a MSP process, this means that ICES spatial information does not cover national participation in shared fishing grounds, which makes it hard to identify common vessel routes between fishing grounds and important harbours and landing places around the Baltic Sea. The ICES data has the potential to provide considerably improved planning evidence where spatial information of the national distribution of catches in the fisheries sector from common fishing grounds can be shown. An agreement of sharing this type of information still has to be discussed between countries.

By taking historical spatial changes of fisheries into consideration, areas relevant for planning may be identified, as areas of interest that do not necessarily correspond with present activities in various catch areas in the Baltic Sea. However, former political and regulatory situations may have an effect on fisheries distribution as well.

There is a need to discuss strategies for the improvement of planning evidence towards a more coherent transboundary perspective. The activity map Fig. 5.3-1 visualises these differences well. The different sizes of the raster of fishing activities due to the various data sources used in mapping. Sweden uses logbook data of positions for set and haul to define squares of activity level, while Latvia's smaller squares are derived by combining VMS positions with ICES squares. Estonia's share of fishing activities in the coherent map is shown by VMS tracks and does not form certain squares for areas of intense fishing activities.

63 See International Council for the Exploration of the Sea (ICES 2015a & b) Interim Report of the Working Group on Spatial Fisheries Data.



Existing use layers

Fishing ports
Trap nets (EE)

Pelagic trawl fishery:

EE (t, 2014-2015, cell dimension 1km x 1km)
182,2
0

LV (t, 2004-2013, cell dimension 1'x1' (ca.1km x 1,85km))
830
4,5

SE (t, 2008-2012, cell dimension 5km x 5km)
5,744
0

Demersal trawl fishery:

LV (t, 2004-2013, cell dimension 1'x1' (ca.1km x 1,85km))
55,95
1

SE (t, 2008-2012, cell dimension 5km x 5km)
1,312
0

Gillnet fishery:

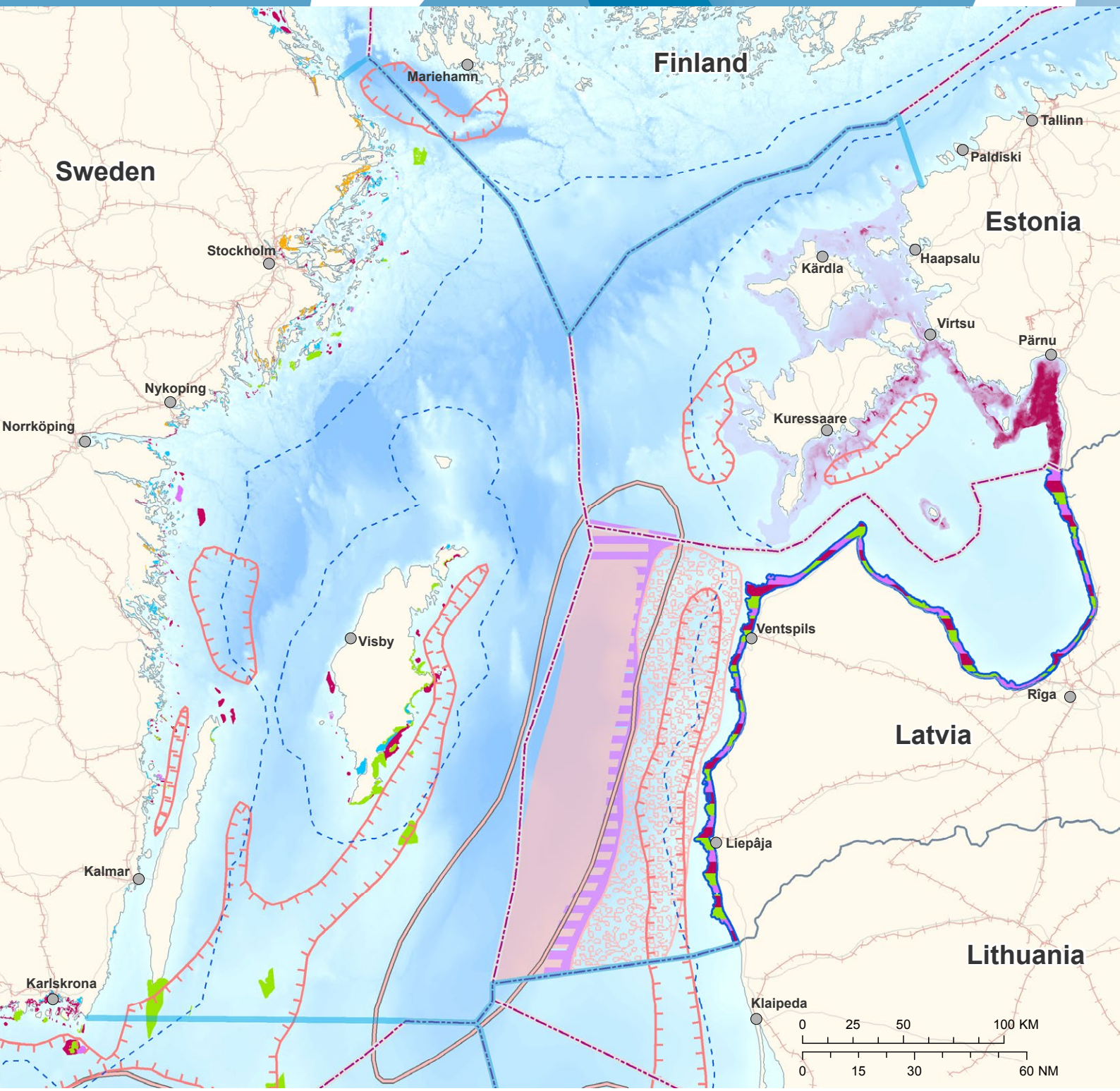
LV (t, 2004-2013, cell dimension 1'x1' (ca.1km x 1,85km))
71
0

Future use layers

Priority areas for bottom trawling according to draft Marine Spatial Plan 2016 (2016) (LV)
Areas of interest for fisheries according to thematic workshop in National MSP process (SE)
National interest of fisheries in Sweden concerning catch-, spawning, nursery or migration areas (SE)

Main cities
Main roads
Railways
Territorial waters
Exclusive Economic Zone
Border of Central Baltic case area

Figure 5.3-1: Fishing activity in the Central Baltic Sea



LEGEND

Spawning areas

Spawning areas Baltic herring model100 (EE)

High: 100

Low: 0

Herring (LV,SE)

Flounder (LV,SE)

Turbot (LV,SE)

Pikeperch (SE)

Common whitefish (SE)

Cod (LV)

Nursery areas

Nursery ground for cod (LV)

Nursery ground for herring, flounder, turbot, smelt, sea trout (LV)

Baltic Cod HELCOM

Nursery area

Spawning area

Main cities

Main roads

Railways

Territorial waters

Exclusive Economic Zone

Border of Central Baltic case area

Figure 5.3-2: Fish Habitats -Spawning and nursery areas in the Central Baltic Sea

Habitat data

Further work is required to develop reliable maps of essential fish habitats, which discriminate spatial and temporal variability essential to support MSP. There are few available comprehensive maps on essential fish habitats. In the habitat map (fig. 5.3-2) the countries differ in presented layers and mapped species. The map illustrates the partial and fragmented information for certain stocks/areas and is, so far, the overall status for data on fish habitats.

Need to improve planning evidence identified in the work of the Central Baltic case study

- Identifying important areas for national fisheries outside a country's own EEZ, on the basis of both present and historical data of activities, are essential for a spatial pan-Baltic fisheries perspective in MSP.
- MSP should strive for coherence regarding input data and visualization of fisheries among countries around the Baltic Sea.

Table 5.3-1: Availability of Planning Evidence on Fisheries in the Central Baltic Area

Legend

Available
Not available
Not available/not specified
Partly available/under development

Spatial data layers	ESTONIA	LATVIA	SWEDEN
Information on distribution of national fisheries in pan-Baltic maps	Not available	Not available	Not available
Important areas for national fisheries outside a country's own EEZ	Partly available/under development	Partly available/under development	Partly available/under development
Historical spatial changes for fisheries and habitats to ensure designations where dynamics in the sector are considered	Not available/not specified	Partly available/under development	Not available/not specified
Electronic logbook with information for positions of set and haul in trawling activities to ensure better spatial precision and the composition and amount of catch by fish species	Available	Available	Available
Electronic logbook with information of position and time duration of fisheries with passive gears to ensure better spatial precision and the composition and amount of catch by fish species	Available	Available	Available
Enforcement to use AIS on fishing vessels operating in small areas with sensitive ecosystems to ensure detailed spatial monitoring and planning evidence	Partly available/under development	Partly available/under development	Partly available/under development
VMS – tracking of vessels >8 meters to ensure better data on small scale fisheries	Partly available/under development	Not available/not specified	Not available/not specified

5.3.1. Estonia: Available and Needed Planning Evidence on Fisheries

The Estonian Fishing Act notes that a person who fishes or collects aquatic plants on the basis of a commercial fishing license is obliged to submit catch, collection, trans-shipment or landing information or other information relating to these works. The fishing data is used as the official source of information to present and protect fishing rights and interests in national and transboundary MSP processes.

The Baltic Sea areas of fisheries related national importance/interests are officially documented based on: a) the Electronic Reporting System (ERS) – the electronic transmission of fishing data for

the Baltic Sea trawl fisheries (including fishing in the EEZ of other countries and landing in foreign fishing ports), b) Fisheries Information System (FIS) data for small scale coastal commercial fisheries, and c) Estonian Fisheries Information System (EFIS) – collects data from the licensed recreational fisheries. As shown in Fig. 5.3-1 Estonian fisheries are covered by ERS from pelagic trawling.

5.3.2. Latvia: Planning Evidence on Fisheries

In the ongoing process of national MSP development, Latvia has not included fisheries data from outside its own EEZ. Discussions within the Central Baltic case study have highlighted the need for improved planning evidence on transboundary issues. Latvian fisheries interests in other countries' EEZ could be presented by landings of fish species (herring, sprat, cod, flounder) and by effort (pelagic trawlers, demersal trawlers and demersal gillnets), but this is not included in the map (Fig. 5.3-1). National interest areas for fisheries are shown in the map, using available information from the Research Institute of Food Safety, Animal Health and Environment (BIOR), ICES public databases (DATRAS) and available scientific literature. The main focus was on the most commercially important fish species (sprat, herring, cod and flounder), aquaculture and biodiversity of fish communities.

In Latvian MSP, important fishing ports were defined based on landings. The most important fishing grounds were calculated using landings and efforts from national logbooks from 2004 to 2013. Important areas of spawning and recruitment were defined using available literature sources and survey data from BIOR. This was recognised as a difficult task due to the lack of scientific knowledge and thus resulted in just a small number of spawning and nursery areas.

The Latvian contribution to the two maps contains data from the Latvian EEZ on:

- The main fishing grounds according to species (sprat, herring, cod, flounder) – annual maps 2004 – 2013 and a summary map for the whole period.
- The main fishing grounds by fishing gear (pelagic trawls, demersal trawls, demersal gillnets) – annual maps 2004 – 2013 and a summary map for the whole period.
- The distribution of the main commercial fish species (sprat, herring, cod, flounder) – annual maps 2004 – 2013 and a summary map for the whole period.
- Landings in the coastal fisheries (herring, other fish species, invasive round goby) – annual maps 2004 – 2013 and a summary map for the whole period.
- Spawning grounds for the main commercial fish species.
- Nursery grounds for the main commercial fish species.

5.3.3. Sweden: Available and Needed Planning Evidence on Fisheries

In Sweden, national interest areas for fisheries are defined in accordance with national environmental legislation, last updated by the Swedish National Board of Fisheries in 2006[64]. These areas are shown in the map (Fig. 5.3-1) and are focused on economic aspects regarding catch areas for certain species as well as commercial fishing ports. SwAM has recently made a data call to the Swedish University of Agricultural Science, including fish habitats. An updated map for fisheries will help national MSP by distinguishing the interest of the sector in relation to the current national interest areas. Key motives behind the new data call, and upcoming mapping, include making better spatial projections of future fisheries by strengthening knowledge regarding fisheries activities and the spatial dynamics that have occurred historically. In accordance to an ecosystem-based approach, SwAM wants to distinguish areas of interest for different fisheries e.g. small scale, large scale and also defined after a certain type of fishing gear. In addition to national interest areas for fisheries, the national thematic work on fisheries in the MSP process complements these areas with important areas outside the Swedish EEZ. These transboundary areas are included in the map (Fig. 5.3-1). They are only roughly sketched but still provide important input to identify transboundary aspects of the sector in the Baltic Sea (SwAM 2016c).

64 Swedish National Board of Fisheries (2006a and 2006b) Areas of special importance for the Swedish commercial fisheries.

5.4. SHIPPING: AVAILABLE AND NEEDED PLANNING EVIDENCE FOR THE CENTRAL BALTIC AREA

Shipping is one of the oldest sea uses and is managed internationally. Thanks to developed technologies (AIS, VMS etc.) a lot of common planning evidence for the Central Baltic countries exists. Shipping in the Central Baltic area can be divided into two main subgroups: small crafts shipping and large-scale shipping. While small craft shipping is mainly on a national interest, large-scale shipping has clear transboundary implications. In addition to ship size, shipping could also be approached through cargo traffic, passenger traffic, recreational small craft traffic, fishing vessel traffic and ports and harbours. The pattern of current shipping stocktake (see Fig. 5.4-1.) is visualized by aggregating AIS data, and using information from navigational charts that have been developed and maintained by national Hydrographic services.

Ship traffic density maps were produced based on the HELCOM AIS dataset. Since 2005, with the cooperation of the national authorities of the Baltic Sea States, the HELCOM AIS network keeps records of ship movements in the Baltic Sea. Thanks to the Baltic SCOPE project, the HELCOM Secretariat was able to use the regional AIS dataset to its full potential. AIS data was used for mapping the traffic shipping density of the entire southern Baltic Sea and the methodology can be explained through two main tasks:

The first task was to prepare the AIS data. The harmonization of the historical data was an important step: the whole dataset had to be pre-processed into the same format, illustrating the same kind of ships (IMO registered ships) and the same areas. The pre-process also involved adding more information about the ship types and ship size. The ship type and the dimensions are relevant when the project partners asked for density maps of ships with a certain length, draught of gross tonnage. The outputs of the pre-processing made up monthly files of AIS data.

The second task was to process the AIS data to produce shipping density maps to be able to understand the marine traffic distribution in the Baltic Sea. The density maps are based on a grid with cells of 1km by 1km from the European Environment Agency (EEA) and it is based on the recommendation from the 1st European Workshop on Reference Grids in 2003 and the later INSPIRE geographical grid systems. In using the AIS data, several points (positions) for each ship were transformed into lines. Overlapping the grid and the lines, made it possible to count the number of lines crossing each cells and to generate density maps using a raster format. By filtering the ships by ship type and dimensions of gross tonnage, it was possible to generate density maps of different ship categories. Due to the quantity of data, it was impossible to use basic software built-in tools. Customized tools were built to process and check the density maps. The tools were also improved upon, in order to generate density maps as fast as possible.[65]

When analysing AIS data by different sizes of ships, it is clearly visible, that bigger ships are limited by depth and that movement is possible in very few places. It is thus important to maintain these routes for the movement of bigger ships. It was also acknowledged, that there are specific routes for passenger vessels that are selected as the most convenient in terms of time and expenses and that those should be maintained as long as possible when planning future uses of the sea.

For mapping present shipping use across borders, the following spatial data were used:

- Shipping intensity maps (HELCOM AIS data[66]);
- Existing shipping routes based on navigational charts;
- Traffic separation schemes;
- Ports.

Table (5.4-1) below clearly shows that the availability of spatial data is quite good, as similar sources of data were used. Some of the data, as traffic separation schemes or yachting areas are not available in some of the countries because they are not designated (c.f. Traffic separation scheme (TSS) cell for Latvia) or a specific priority is not given to them (c.f. Yachting area cells

65 For more information, see Baltic SCOPE technical report (HELCOM 2016).

66 To mirror the existing use of shipping in the CB case study area a shipping intensity analysis was carried out by HELCOM Secretariat / for more information see Shipping.

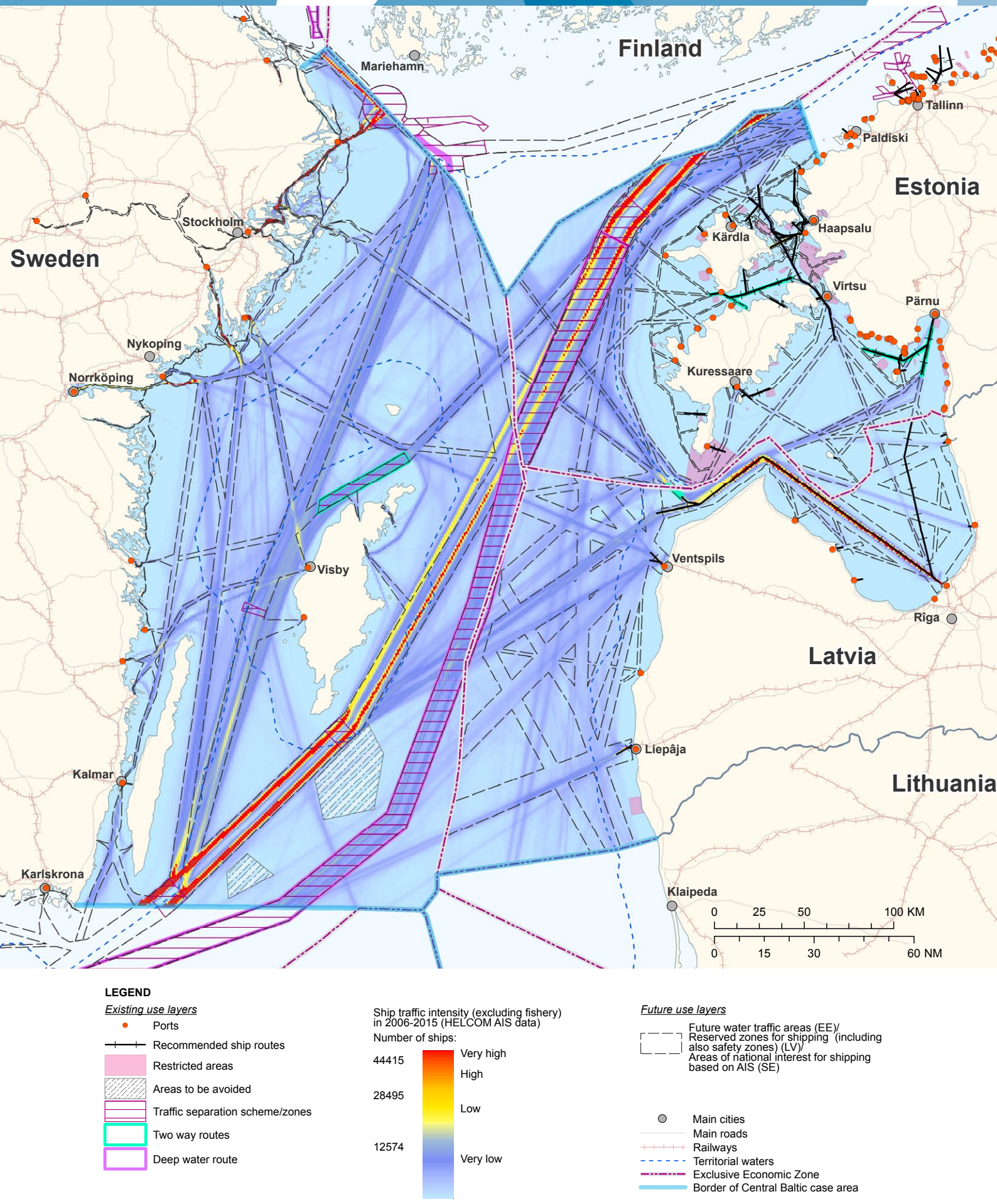


Figure 5.4-1: Interests of the shipping sector in the Central Baltic Sea

for Latvia and Estonia). Very little data differs between countries and the differences are mainly related to specific geographical places and specificities, such as ice conditions and depth of sea; for example, Pärnu Bay with ice roads and the western coast of Latvia with former mining areas where shipping is allowed. The main contrasts between countries are the different approaches and stages in MSP that relate to different applications of future uses.

Table 5.4-1: Availability of Planning Evidence for Shipping in the Central Baltic Countries

Legend

Available | Not available/not specified | Not available

Spatial data layers	ESTONIA	LATVIA	SWEDEN
HELCOM Secretariat AIS maps			
Existing ship routes (areas/polygon) based on navigational charts			
Traffic separation scheme (TSS)			
Deep water route			
Two-way route			
Anchorage area			
Yachting area			
Ports			
Military exercise areas			
Dumping ground		Including dumped explosives (point data)	
Restricted areas			
Protected areas where navigation is forbidden			
Wrecks			
Underwater cultural heritage (incl. protected wrecks)			
Major road			
Major railroads			
Ice Road routes/areas			
Bridge			
Former mining area, open for shipping			
FUTURE USES			
Planned water traffic areas – EE; Reserved zones for shipping – LV; Designated areas of national interest - SE			
Planned ports – ports under development			

The future use of shipping planned water traffic areas (Estonia), reserved zones for shipping (Latvia) and national interest claims for shipping (Sweden) were used, although they have an indicative meaning to some extent. In order to better understand the future developments, various socio-economic data, including developments on land, can be consulted as well. An increase in production can easily affect cargo transport with implications on development in the shipping sector.

Shipping is impacted by other sectors and, in turn, it also affects other sectors. After mapping current uses and future developments of shipping it is important to also analyse the developments in comparison to other sectors, such as defence, environment, cultural heritage, mineral extraction, infrastructure (land transport). Understanding and correct interpretation of each other's data is a challenge for transboundary MSP (see also Chapter 6). The exchange of data requires proper understanding. When possible, data used should be based on similar grounds. Where this is not possible, the differences need to be made evident to avoid misinterpretations.

5.4.1. Estonia: Available and Needed Planning Evidence on Shipping

Maritime transport is best illustrated by datasets that represent shipping and different restrictions to shipping, including cables and environmental restrictions.

In Estonia there have been two pilot areas where MSP is conducted and water traffic areas are planned there. Planned water traffic areas focus on large-scale shipping (e.g. Pärnu port) and the width of planned water traffic area is 1 nautical miles, whereas the planned width of small craft (<24m length) routes is 0.5 nm. Additional research is needed to collect data for MSP and there is a need to map small vessel routes to determine which areas have heavy small vessel traffic. There is also a need to analyse existing dumping grounds and their possible reallocation in Estonian waters.

5.4.2. Latvia: Available and Needed Planning Evidence on Shipping

Reserved zones for shipping were developed using data on existing movement of international cargo, as well as planned development directions of ports. HELCOM processed AIS data (cargo and passenger) for the last 10 years and defined the main shipping directions within national MSP, these were discussed and harmonised with Lithuania, Sweden and Estonia. The main shipping zones are estimated to be 6 nautical miles wide (including safety zones of 2 nautical miles on either side). Other shipping zones (including their safety zones of up to 1 nautical mile on either side) vary from 4 nautical miles for strategic directions to 0.8 nautical miles for shipping directions of local significance.

5.4.3. Sweden: Available and Needed Planning Evidence on Shipping

Highlighted national interests for shipping consist of direct shipping routes connected to each other and to an international network. The extent and scope of these routes are decided by the IMO and HELCOM as well as by RAIS analyses of actual vessel movements. Areas of national interest for shipping, based on the Environmental Code are pointed out and adapted to new needs by the Swedish Transport Administration, based on vessel movements and strategic considerations. In contrast to Estonia and Latvia, Sweden has no standard distances for representing shipping interests. However, there are general guidelines from the Swedish Maritime Administration regarding safety distances, i.e. for OSW farms and shipping.

5.5. CONCLUSIONS FROM WORK WITH PLANNING EVIDENCE IN THE CENTRAL BALTIC CASE STUDY

The mapping exercise allowed planners to recognize data gaps and needs. When presented to sector stakeholders, these maps made some of them recognize the importance of spatial coexistence and spatial claims (see chapter 6). Moreover, discussion around the maps created an understanding that Central Baltic countries need to find agreement on how to resolve certain MSP evidence issues soon (see chapter 7, recommendations).

Important issues among the specific sectors include:

- **Environment:** Harmonisation of data sets and common benthic habitat mapping is needed in order to provide a better knowledge base for spatial impact assessment of sea uses.
- **Environment:** Discussion of the possibilities to map some MSFD indicators spatially are under way, the result would be of great importance for spatial analyses for MSP.
- **Fisheries:** Despite all countries in MSP talks use logbook information to illustrate the fisheries sector, the use of VMS data to produce a coherent map for the whole Baltic Sea was discussed. However, VMS data are sensitive and the use of data without special permission is restricted. Using logbook information longer time periods can be covered (Latvia's example starting from 2004) while VMS data only covers the period starting from 2012. VMS data do not cover small scale fisheries in coastal waters. So to illustrate actual fishing grounds on the Baltic level VMS data are better, while to illustrate temporal variation (potential fishing grounds) – logbooks include more information.
- **Shipping - further research:** socio-economic importance of shipping; feasibility studies about the risk assessment and risk management plans based on shipping safety and security and other new sea uses; small craft routes and most frequent sailing areas.

The main conclusions regarding planning evidence in general:

- **Fragmented data collection:** information on bird distribution is spatially fragmented i.e. it consists of scattered areas where research/monitoring was performed. E.g. in Latvia holistic monitoring was performed only in 2016 for its EEZ.
- Data collection/production methods can differ between countries. E.g. concerning information on fish nursery and spawning areas Sweden has several spatial data layers, Latvia's spatial layers (except sprat) are based on experts assumptions, while Estonia's spatial layers are based on modelling.
- Countries use the same data sources for fisheries and shipping sectors, only the processing and mapping methodologies differ.
- The development of **joint mapping criteria** is needed in the future, in order to obtain a joint/Pan Baltic picture for each sector's interests at sea. This kind of information might be used for transboundary discussions. The Baltic SCOPE time frame did not allow experts to continue discussion on data content and processing methodologies. Nevertheless, the experts suggest a continuation of such discussions in future projects, involving international research and sector organisations, such as ICES, IHO, HELCOM, VASAB and others.
- **A map on assembled national MSP:** It is possible to create one joint map with zoning from different national marine spatial plans (output data). Though this will only be possible when all national marine spatial plans are adopted and when the conditions, descriptions and the content for zoning types are translated into English. It's also crucial to define standards for zoning data. Such geospatial data needs to be publicly accessible and available at the DG MARE MSP platform.[67]
- **Pan Baltic maps** to represent different sectors should be created by joint collaborative efforts of organizations such as IHO, ICES, HELCOM, BIRDLIFE INTERNATIONAL etc. Common mapping criteria need to be developed and a map purpose needs to be jointly agreed.
- The Central Baltic experts support the **input/output data mapping approach**, including main data sets for each MSP relevant sector, of the **HELCOM/VASAB data subgroup.**[68]

67 See http://msp-platform.eu/.

68 See http://www.vasab.org/index.php/maritime-spatial-planning/bsr-msp-data-esg.

6. CROSS-SECTOR INTERACTIONS AND PLANNING CHALLENGES

Cross-sector interaction in transboundary MSP in the Baltic Sea and the mapping and analysis of such interactions, as found here, is unprecedented. This chapter zooms into both planners' and stakeholders' reflections on cross sector interactions and synergies, including important reflections of stakeholders on their sectors in relation to each other and on MSP as a point of departure, but also going beyond that. These reflections were made to reach overall conclusions for the sectors and to formulate recommendations for future work, both for transboundary and national MSP.

The Central Baltic case study placed strong emphasis on stakeholder involvement as a key to understanding the sectors' needs and demands in the use of the marine space. Methods such as thematic meetings, the World Café method and the Stakeholder Conference were successfully used for information sharing and to facilitate an interaction between sector experts and non-governmental stakeholders and planners, to promote a common understanding and the identification of conflicts and synergies as well as potential solutions (see chapter 2). Although no critical conflicts could be identified during the cross-sector discussions, the added value of engaging stakeholders into thinking in terms of potential conflictive or synergistic scenarios was that they could anticipate possible problems and opportunities.

Essentially, as no planning decisions result from it so far, this part of the work could be seen as an experimental simulation game both for planners and stakeholders, using a concrete area and existing data with real stakeholders. [69] Such an experience for stakeholders can support coherence between national Maritime spatial plans. Sharing knowledge can also enhance a common understanding between sectors, which provides a better basis for future decision-making.

For cross-sector analysis, the planners used an overall map (Fig 6-1) in combination with bilateral cross-sector tables to get both the sector experts (developing the cross-sector conflict and synergy analysis at the thematic meetings) and stakeholders (developing conflict and synergy tables and the map at the Stakeholder Conference) to think outside their sector box. The overall cross sector map and interaction tables, and their further processing in the Planners' Group provided interesting insights on stakeholder interaction, planning evidence and potential planning problems, which will be discussed below.

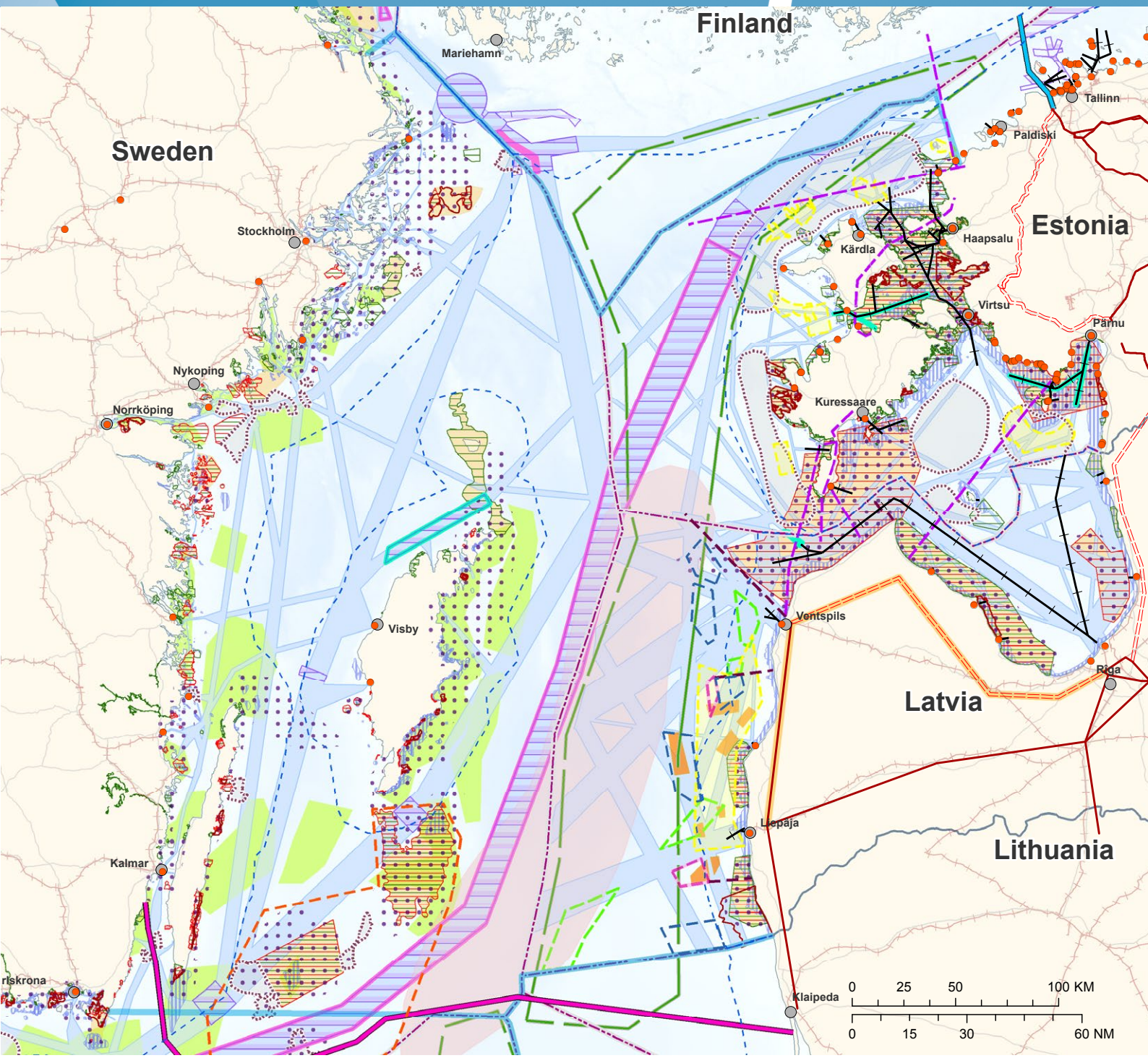
6.1. A FIRST CROSS SECTOR MAP FOR THE CENTRAL BALTIC: THE COMPLEXITY OF CURRENT AND POSSIBLE FUTURE USES

The map (Fig. 6-1) is a project result indicating possible spatial claims. It shows the current situation, spatial sector strategies, interest of stakeholders and non-spatial sector visions. As a first attempt to put together all existing information spatially, the map clearly shows the complexity of transboundary coordination, with all its different planning stages. The map has also been used as a tool in the project to facilitate a discussion on the coexistence of sectors in the sea space covered by the Central Baltic case study.

Figure 6-1: The complexity of current and possible future uses in the Central Baltic Sea. [70]

69 There are also simulation games that are more game than real (e.g. the MSP Challenge, developed by Delft University and the Dutch ministry responsible for MSP; www.mspchallenge.info/).

70 This comprehensive map is based on presently available data. It is an updated and fine-tuned version of an earlier map used at the Stakeholder Conference in Jūrmala to promote cross-sector discussions. It is also based on input from these stakeholders.



LEGEND

Existing use layers

ENVIRONMENT SECTOR
- Ramsar sites
- Important Bird Areas
- Natura2000 sites - Birds Directive Sites (SPA)
- Natura2000 sites - Habitats Directive Sites (pSCI, SCI or SAC)
- HELCOM marine protected areas
- Spawning ground - herring, flounder, turbot
- Spawning ground - cod

- Main cities
- Main roads
- Railways
- Territorial waters
- Exclusive Economic Zone
- Border of Central Baltic case area

Future use layers

- Suggested MPA for protection of Harbour Porpoise in SE EEZ
- Investigation areas for potential establishment of MPAs in Latvian EEZ according to draft Marine Spatial Plan 2016 (LV)

FISHERIES SECTOR
- Priority areas for bottom trawling according to draft Marine Spatial Plan 2016 (LV)
- Areas of interest for fisheries according to thematic workshop in National MSP process (SE)
- National interest of fisheries in Sweden concerning catch-, spawning, nursery or migration areas (SE)

Existing use layers

ENERGY SECTOR
- Existing electricity overhead line (LV; EE)
- Areas of permits for investigation of conditions and exploration of wind energy (LV)

Existing underwater power cables:
- Nordbalt Cable (SE-LT)
- EstLink1 (EE-FI)

SHIPPING SECTOR
- Ports
- Recommended ship routes
- Traffic separation scheme/zones
- Two way routes
- Deep water route

Future use layers

- Ongoing grid expansion until 2020 (LV; EE)
- Visioned perspective power lines/ directions (LV; EE)/ NP EE2030 Energy line(EE)
- Suitable areas for wind park development according to draft Marine Spatial Plan 2016 (LV)
- Areas of interest for developing off-shore wind facilities (LV; EE)
- Areas of national interest for seabased wind power (SE, EE)
- Perspective electricity cables according to draft Marine Spatial Plan 2016 (LV)
- "Kurzemes loks" (LV)

- Future water traffic areas (EE)/ Reserved zones for shipping (including also safety zones) (LV)/ Areas of national interest for shipping based on AIS (SE)

With regard to the overall map as a tool for discussion, the following needs to be disclosed:

- The overall map is pioneering work – it is the first ever attempt to actually put together information on all four sectors for the Central Baltic Sea!
- The main emphasis of the Central Baltic case study work has been on single sector maps, and even those did not sufficiently represent sectors comprehensively e.g. in a coherent transboundary manner (chapter 5).
- Cross-sector maps imply even more challenges in terms of visualizing in an easy-to-read, understandable and convincing manner both the conflicts and synergies existing when multiple sectors use the sea space.
- The overall map developed by the Central Baltic case study fills the gap of earlier mapping attempts since it contains both existing uses and interests that sectors have voiced regarding future sea use. What is more, the map also displays planned zones.
- Importantly, the map developed by the case study expands the overview of sectors and provides an opportunity for stakeholders to learn about spatiality.
- Interestingly, from a transboundary perspective, the map indicates very few cross-country conflicts, whereas there may be quite a few cross-sector conflicts both within one country and bilaterally.
- A number of complex sector overlaps should be worked on further / in follow-up projects, for instance the areas to the south of Gotland (Swedish EEZ), and the Irbe Strait as a joint area for Latvia and Estonia.

When it comes to interpreting the content of the map through planners and sector experts, the following points can be made:

- The Central Baltic marine area does not look very crowded yet, but it is obviously full of overlapping uses and values, which interact in one way or another.
- The map may seem a confusing starting point to some, but MSP is a tool to resolve the confusion - the map does show only four sectors. By integrating additional sector perspectives, MSP would become even more complex.
- Since both existing and planned uses and more visionary ideas (e.g. links) are included, a clear legend is crucial.
- The incoherence of lines and polygons on the map does not necessarily mean conflict (it refers to how different countries and sectors illustrate their interests).

Taking these considerations into account, one can clearly see the nature of MSP, serving as a strategic framework for sectors by providing boundaries for different sectors to use for trade-offs with others. MSP does not need to define new sector goals, but can balance existing ones in order to achieve a general objective – the sustainable use of the sea, both for good environmental status and for the facilitation of Blue Growth. The planners, who developed the map, conclude that it might be necessary to remind the sectors about two important aspects here and when looking at their visualised use of the sea space a) no competence is taken away from them, b) but rather, they are considered and involved as the main actors in a new process.

6.2. A FIRST COMPREHENSIVE CONFLICT AND SYNERGY TABLE – A STEP TOWARDS SOLUTIONS?

In addition to the map discussed above, the Planners' Group of the Central Baltic case study developed a Comprehensive Conflict and Synergy Table (Table 6-1) after the transboundary Stakeholder Conference.[71] The table provides an overview of the most important MSP relevant cross-sector conflicts and synergies in a trans-boundary context for the Central Baltic area. So far,

71 This conference was organised in Jūrmala, 31 May - 1 June 2016. Input also came from the work with stakeholders in two earlier thematic meetings already looking into cross-sectoral conficts and synergies.

the identified trans-boundary conflicts and synergies in the Central Baltic area are of the potential kind. The table also suggests some possible solutions and relevant institutional actors with both mandate and power to conduct discussions and arrive at solutions on the subject.

Based on further discussions in the Planners' Group, Table 6-1 cannot be considered as being the final checklist but needs to be considered with care. The table neither shows the planners' views nor does it provide an objective truth. Rather, it shows the opinions of the participants in the different groups in the cross-sector discussions at the stakeholder meetings. Thus, the table can be seen as a **first step**, indicating a **direction towards the development of planning criteria**. The matrix also indicates **potential pathways for identifying solutions** and **where to find responsible actors** to proceed with in working towards finding solutions. For national MSP and cross-sector planning, this matrix can provide directions on where to search for responsible actors and possible solutions in addressing cross-sector and transboundary issues.

Looking at the different elements of the table, the level of detail differs across sectors. This is due to the participating stakeholders and the perspectives provided. Environmental and energy stakeholders were more actively engaged throughout the whole process. One explanation is that the benefits of engaging in MSP for their sectors were apparent. The opposite was observed with shipping and fisheries. Here, an explanation may be that other international frameworks already regulate many spatial aspects, so the need to become engaged in yet another one, is not perceived as favourably among these sectors.

The **synergies** in the table are mostly related to an uninhibited co-existence of different sectors, on the one hand, and to positive impacts on other sector's aims, on the other. Such insights can be useful in future MSP processes, when designating zones for multiple uses or when defining specific indicators for the evaluation of MSP.

With regard to **conflicts**, especially the perspectives of the environment and energy sectors in the table are interesting:

- The perspective of the environment sector was that of pressures and cumulative effects, which leads to extensive descriptions of possible conflicts with other uses. Most conflicts refer to negative impacts on ecological values. In most cases, this can be addressed by applying the precautionary principle. Thus, there is still a long way to go to increase knowledge and deeper analysis of possible impacts on the environment.
- Energy, in turn, seems to be in conflict with all other uses. During the discussions at the Transnational Stakeholder Conference, OSW were mentioned as an obstacle for shipping. Also concerns on spoiling fishing grounds and the possible negative impacts on certain species were raised. These concerns are indicated in the table, where descriptions of possible conflicts due to the locations of OSW in environmentally sensitive areas are quite detailed. Nonetheless, some input was also given on how to address these conflicts, e.g. by formulating limiting planning criteria for MSP (e.g requiring soft-beds instead of reefs for the construction of new OSW farms as a precaution and trade-off with environmental interests).

One should also note that these conflicts are based more on potential concerns rather than real and current conflicts. This is partially owed to the fact that the energy sector is relatively new in the Central Baltic Sea. However, this also clearly indicates the difficulties for new economic activities to compete with well-established sea uses and for those sectors to prove their benefits for society.

Thus, the overall table condensed from stakeholder discussions (Table 6-1) does not mirror the actual situation. The planners currently see no transboundary conflict area in the Central Baltic Sea; also synergies are of quite a hypothetic character. Moreover, the lists of conflicts and solutions are too uneven between sectors and show the perspective of the experts participating in the group. Although both tools seemed to successfully raise mutual awareness and understanding, they are not exactly tools for MSP yet. Rather, they indicate directions in which planners can look for solutions and deal with cross-sector stakeholder involvement.

Table 6-1: Comprehensive Conflict and Synergy Table for the Central Baltic case stud

		Environment	Shipping
Environment	Scope of MSP		Intensively used shipping routes can have negative impacts on areas of high ecological value (e.g. disturbance to species, risk of oil spills, damage to benthic habitats in shallow areas, etc.)
	Institution in charge		Ministries and other competent authorities in charge of transport and environmental protection, nature conservation, maritime administrations, port authorities, research institutes related to marine ecology.
	Possible solutions		• A common Baltic map on areas of high ecological value as essential evidence for planning shipping routes; • Agreements among planners and experts on thresholds/criteria when MSP solutions on rerouting should be investigated (e.g. important sites for red listed birds); • Proposals for rerouting can be integrated in MSP solutions, but agreements on the international level (as per IMO) is needed to enforce these solutions in practice; • Solutions for rerouting should be based on a cost-benefit analysis. If reallocation is not possible, other managerial suggestions could be given through other means aside from planning.
Shipping	Scope of MSP	Shipping safety as a common interest of both sectors	
	Institution in charge	Ministries and other competent authorities in charge for of transport and environmental protection, maritime Administrations, port authorities.	
	Possible solutions	Measures for improving shipping safety are essential for avoiding damage to marine ecosystem, caused by the shipping accidents and oil spills.	
Fisheries	Scope of MSP	Maintaining of benthic habitats important for marine biodiversity as well as for viable fish stocks.	Potential multi-use of ports.
	Institution in charge	Ministries and other competent authorities in charge for nurture conservation and fisheries, fisheries related research institutions.	Ministries and other competent authorities in charge of maritime transport and fisheries.
	Possible solutions	Pan-Baltic mapping of spawning and nursery areas.	
Energy	Scope of MSP	• OSW deployment contributing to the goals of increasing the share of RES in total gross energy consumption; • OSW farms can function as sanctuaries for fish populations or as artificial reefs, thus creating habitats for benthic communities.	**Potential multiple use:** • Common use of ports and services; • Use of service ships for maintain energy installations; • OSW farms as navigation signs.
	Institution in charge	Ministries in charge of RES and nature conservation, national TSOs, research institutes related to marine ecology.	Ministries in charge of RES, national TSOs. Ministry of Transport, Maritime Administrations, Port authorities
	Possible solutions	Multiple uses e.g. floating OSW farms and areas of ecological value.	

Synergies

Conflicts

	Fisheries	Energy
Environment	• Impacts of demersal trawling to benthic habitats; • By-catch of seals, harbour porpoises, birds; • MPAs, in some cases, as a limitation of the access to fishing grounds.	Most significant negative impacts can be expected in environmentally sensitive areas: • Impact on benthic habitats (physical loss, fragmentation) from the construction of wind farms and cables; • Obstacles for migration / access to feeding grounds of birds, seals and bats; • Disturbance to mammals (e.g. harbour porpoises) and other species caused by noise from construction, pile driving, maintenance, dismantling works; • Offshore wind farms can potentially create conditions for the migration of invasive species and the replacement of native populations. Linear infrastructure: • Construction of subsea cables can have negative effects on species (e.g. disturbance, underwater noise, electromagnetic field); Besides direct effects on-site, OWF can have cumulative impacts across borders on migration patterns of bird and bats, habitat connectivity etc.
	Ministries and other competent authorities in charge of nature conservation and fisheries, fisheries related research institutions.	Ministries and/or state agencies in charge of RES, environmental protection/nature conservation, research institutes related to marine ecology.
	• Knowledge exchange about the impact of different gear types and eventually the usage of gear that does not harm the benthic habitats and/or the purpose of the MPAs; • Temporal restrictions or the restriction of certain gears in certain areas (e.g. spawning and nursery areas of fish, bird concentration areas); • A common Baltic map / knowledge on areas of high ecological value as essential evidence for mitigating the impacts of fisheries on the marine ecosystem.	• Considering environmentally sensitive areas when designating areas for energy; • Transnational coordination on locating OSW farms as a possible solution in minimizing negative and especially - cumulative - impacts on the environment and particularly on ecologically sensitive areas; development of common approaches / co-operation on the assessment of cumulative impacts; • Transnational coordination in respect to energy production and the possibilities for transmission interconnections between the countries; • Choosing soft-beds instead of reefs for the construction of OSW farms as a precautionary principle and trade-off with environmental interests.
Shipping	• Shipping routes can limit access to fishing grounds; • Shipping routes could impact fisheries with passive fishing gears.	**OSW farms:** • Can limit space for shipping activities • Can have negative impact on shipping safety and rescue operations **Linear infrastructure:** • Cables (and safety corridors) may restrict anchoring in certain areas
	Ministries and other competent authorities in charge of maritime transport and fisheries.	Ministries, maritime administrations and/or state agencies in charge of marine transportation, national TSO.
	Avoidance of major shipping routes through important fishing locations.	• Timely exchange of information and development plans.
Fisheries		**OSW farms:** • Can destroy habitats of benthic species; • When constructed on reefs, can have immediate and long-term negative impacts; • Construction, maintenance, dismantling works disturb certain species (displacement/alteration of habitats); • Potentially create conditions for the migration of invasive species and the replacement of native populations; • Cumulative effect on regional scale. **Linear infrastructure:** • Construction of cables can have negative effects (physical loss, biological disturbance, electromagnetic field, underwater noise) on certain species and habitats.
		Ministries and other competent authorities in charge of energy and fisheries, fisheries research institutions.
		• Avoidance of locating energy production areas at important fishing locations; • Avoidance of important fish habitats; temporal solutions for foundations; monitoring habitat effects.

Energy	**Potential multiple use**
	• Floating OSW farms could possibly be combined with areas important to certain species of fish
	• OSW farms can potentially be used for aquaculture
	• OSW farms under certain conditions (design/technology) can serve as:
	  ◦ Potential areas for fish habitats
	  ◦ Exclusive areas for certain types of commercial fisheries	

	Ministries and other competent authorities in charge of energy and fisheries, Fisheries research Institutions	
	◦ Review of legal framework ◦ Periodic review of technological development and results of studies on effects that energy infrastructure has on fish and fisheries	

6.3. NEXT STEPS IN CROSS SECTOR ANALYSIS

Based on the limitations presented in the previous section, a combined reflection and analysis of both the overall map and the Comprehensive Conflict and Synergy Table clarifies that in the majority of sea space overlaps, sector interests may actually coexist. This is especially the case in relation to the environmental sector, where a lot of negative pressures originating from other sectors might be reduced by preventive actions.

Methodologically, synthesis maps and other ways to combine data are helpful, but need to be interpreted and used with care. The following has to be considered:

The degree of reality: When analysing future use of the sea, there is a need to differentiate between more diffuse visions, spatially specific strategic priorities and binding reservations or zoning. The approaches differ between countries and also within one country, as some of the planned areas correspond to sector strategies, some are specific reservations and zoning proposals. Power lines are a good illustration for this complexity: in Estonia, power lines are strategic and based on basic schemes, whilst Latvia has strategic documents and visionary goals that are taken into account and indicated spatially. There is no intention to plan cables, but to plan possible connections between countries. Basically the same applies to other sectors, e.g. shipping lines or other uses specified by respective sectors.

What maps actually show: i.e. the degree of alignment in a map is not necessarily an indicator for the presence or absence of conflicts. Shipping lanes are a good example, where one country may have shipping lines without safety zones that meet with the inner lines of shipping lanes of another country with safety zones.

Uncertainty: It is also important to mention, that the first round of MSP usually implies high uncertainties, as knowledge on different bio-geophysical processes in the sea are lacking and some measures may lead to uncontrollable cumulative effects. Planners have to take that into account and planning may need to be more strategic with minimal use of binding zoning. Such a process also needs to be based on an active exchange with other sectors and stakeholders and in order to effectively gain an idea on the present situation and start discussing a holistic picture of future and sustainable sea use. But at the same time, one has to be aware that the knowledge provided is only based on individual participating actors.

Grasping this and dealing with the resulting problems requires a well-developed understanding of each other's data and planning system. Transboundary cooperation (such as through Baltic SCOPE) provides an occasion to develop such a common understanding between planners, both on basic data and on the purpose of different zones.

Reflecting on the interactive process of transboundary and cross sector analysis for MSP, one has to be aware of the following: The general logic behind spatial, long-term and comprehensive planning, including MSP, is novel for marine sector stakeholders. Both, the sector experts and the planners were challenged to understand each other's needs, the information and tools available and what opportunities MSP offers to improve governance and management of the Baltic Sea. It takes time and trust to develop a dialogue. Sector representatives need to understand MSP as an approach that it is not intended to replace sector management mechanisms while the planners need to develop a deeper understanding of each sectors' activities, spatial dynamics and institutional conditions.

Last but not least, it needs to be emphasized that developing and using both the overall map and the table have been important steps towards conclusions and recommendations in Central Baltic case study work. The final chapter is, to a large extent, based on discussions between the sectors described above and the solutions identified through the mapping of conflicts and synergies and planning-work related challenges.

7. CHALLENGES FOR MSP IN THE CENT–RAL BALTIC AND RECOMMENDATIONS HOW TO ADDRESS THEM

Through work shown in the earlier chapters the Central Baltic planners have derived a number of challenges and recommendations for each sector and for a continuation of MSP in the Central Baltic in general. The project has been a success in many ways, but there is still quite a bit of work to do until transnationally aligned MSP becomes a reality. The recommendations provide priorities for the Central Baltic case study.

This chapter synthesises the encountered challenges and proposes recommendations on integrating the four sector perspectives into MSP for the Central Baltic Sea, starting again with the environmental perspective. Each sector section (from 7.1 to 7.4) presents a number of key challenges combined with targeted recommendations on actions to take, using earlier analysis from various perspectives: a) sector status and developments (from chapter 3), b) institutional framework (see chapter 4), c) available knowledge base (chapter 5), and d) cross sector analysis and identified conflicts (chapter 6). These recommendations are targeted either on sectors or take an overall Central Baltic case study perspective. The challenges and recommendations are based on papers developed by the different expert groups in the summer of 2016. In a meeting in Copenhagen (September 2016) the Planners' Group processed them and included many recommendations into a discussion at an overall Baltic SCOPE project level, as they seemed relevant for the Southwest Baltic case study and the overall project (see report Recommendations report and footnotes).[72] The chapter concludes with an outlook on overall learning and achievements and future challenges that need to be addressed.

7.1. CHALLENGES AND RECOMMENDATIONS TO INTEGRATE AN ENVIRONMENTAL PERSPECTIVE INTO MSP FOR THE CENTRAL BALTIC SEA

In discussions within the Central Baltic environmental expert group, meetings with environmental stakeholders organized by Baltic SCOPE, and national MSP related meetings, a number of key challenges related to addressing environmental issues in MSP were identified.[73] The focus was on issues of transboundary importance or on implications that can be addressed by MSP – with an aim to achieve GES (implementing respective EU-directives and national regulations) and maintaining resilient marine ecosystems and ecosystem services.

The main challenges to include an environmental (ecosystem-based management) perspective in MSP are related to a) achieving a cross-border perspective on the connectivity of MPAs throughout the Baltic Sea area, b) creating institutional coherence regarding the implementation of the MSFD and needs for data collection including human pressures, c) improving the overall knowledge base including the harmonization of data, and (d) dealing with ongoing, larger-scale environmental change processes (such as climate change) and their implications for the marine environment. More concretely, challenges and related recommendations follow:

a) Including environmental issues in transboundary MSP

Managing open ecosystems such as the sea through MSP requires a perspective beyond national borders. Taking an ecosystem-perspective on marine ecosystems with few distinctive boundaries implies taking into account the connectivity of sites and the coherence of Baltic MPAs. Moreover, when licensing activities, a broad perspective beyond the actual planning site is necessary to achieve consistency in the cross-border procedures of environmental assessments (showing potential or existing conflicts).

The amount and degree of human pressures and their individual and cumulative impacts have to be seen in a trans-boundary perspective, taking into account developments in different parts of

72 Baltic SCOPE Recommendations on Maritime Spatial Planning Across Borders available at www.balticscope.eu

73 The CBC Environmental Topic Group focused on the challenges in addressing environmental issues within MSP and not on those for achieving environmental objectives in general. General environmental challenges are addressed in Chapter 3 on "the current status and trends".

the Baltic Sea and their overall impact on marine biodiversity. An activity planned in one or several parts of the Baltic Sea may influence the state of the environment at a different corner of the Sea (e.g. the location of wind parks in different countries might affect bird migration patterns as a whole across the Baltic Sea).

RECOMMENDATIONS

Use an ecosystem perspective in problem analysis, data collection, environmental assessments and planning. This is already recommended in e.g. the HELCOM-VASAB and the EU principles. Thus, the Central Baltic case study supports the implementation of these principles in general. As a first attempt an EA checklist has been developed (Schmidtbauer Crona et al. 2017).[74]

Target groups: all, especially MSP authorities and other interested stakeholders

Identify MSFD descriptors and indicators that can be applied for spatial assessment of impacts within MSP and related SEA and EIA procedures.[75]

Based on screening of the MSFD indicators in EE, LV and SE the following descriptors and proposed criteria are most relevant:

- Descriptors biodiversity (D1): habitat and species range, habitat quality, and ecosystem structure.
- Sea floor integrity (D6): physical damage and community state.
- Introduction of energy, including underwater noise (D11): distribution in time and place of loud, low and mid frequency impulsive sounds and continuous low frequency sound.
- Commercial fishery (D3): indicator spawning stock biomass – spatially explicit species-specific data sets.

Target groups: national and trans-national environmental authorities

b) Creating institutional coherence between MSP and transboundary environmental management

Even if MSP is considered an essential instrument in achieving GES according to the MSFD – as acknowledged by the MSP Directive – MSP still needs operational translation and connections to existing frameworks and agreements at various institutional levels. Not the least the implementation of the EU's MSFD and Habitat Directives are relevant. So far, MPAs have been established based on a national perspective; there is a need to aim at joint (transboundary) evidence creation for the whole Baltic Sea.

RECOMMENDATION

Assess the coherence of MPA-networks in the Baltic Sea and identify solutions that can be provided by MSP to improve the coherence of MPA-networks using the following criteria (as a minimum): [76]

- Repetitiveness: habitat/species coverage within the MPA network to ensure viability of endangered species populations;
- Connectivity: concept of Blue corridors, involving functional interconnection between the sites and conditions for the spreading of species.

Target groups: national environmental and MSP authorities, future joint international projects involving national marine data institutions (e.g. HELCOM etc.)

74 See Baltic SCOPE General Recommendation on Planning Evidence Nr. 6.

75 See Baltic SCOPE Recommendation on Environment Nr. 4.

76 See Baltic SCOPE Recommendation on Environment no. 3.

Moreover, the effects of human-induced pressures on the environment are far from well understood, resulting in insufficient or ineffective management of MPAs as well as in difficulties to identify appropriate measures under the MSFD to achieve GES in marine waters. There is a need to collect seamless data on spatio-temporal patterns of key environmental variables (biotic and abiotic; inside and outside of MPAs) and sea uses. There is also a need to assess how existing pressures such as eutrophication, pollution, underwater construction, climate change etc. both separately and in combination influence the marine environment. Human pressures need to be seen in a transboundary perspective, including developments in different parts of the Baltic Sea and their overall impact. Thus, a common methodology is needed to assess cumulative pressures both at national and transboundary scale. General assessments of particular sea use impacts can be misleading, as the actual level of impact depends on intensity, space and technologies used. Therefore more precise criteria to apply the precautionary principle are needed. Even if there are general definitions at the EU level, it is necessary to further specify and agree on how to concretely apply the principle in MSP. In relation to EIA and SEA procedures, common guidelines are needed at least at the national level (requirements for data collection, assessment standards) as well as an infrastructure to share such data. Sharing mechanisms should be developed. They could assist the assessment of cumulative pressures.

RECOMMENDATION

Develop methodologies to assess pressures (both individual and cumulative) on the marine environment that can be applied within the MSP process to ensure that sea use developments are not in contradiction to objectives related to achieving GES:

- Establish links to MSFD objectives and GES indicators, coordination with Programs of measures.
- Develop methods to assess cumulative pressures of all human activities on the marine environment at local, national as well as transboundary levels.[77]
- Define conditions for applying the precautionary principle within MSP.[78]
- Develop guidelines/criteria for impact assessment procedures and mechanisms for sharing of relevant data.[79]

Target groups: national environmental authorities and future joint projects involving researchers to develop ideas on how to link interactive pressures and ecosystem values.

c) Challenges related to planning evidence and data needs

As chapter 5 on planning evidence indicates, there is still a general need to improve, harmonise and complement the knowledge base – especially from a transboundary perspective. More data is needed to assess the status and function of marine ecosystems. Information on the status of the marine environment, the distribution of species and habitats, and on marine ecosystem services is essential to understand how the resilience of marine ecosystems and related benefits for society are affected when planning the intensity and allocating space for maritime activities.

RECOMMENDATIONS

Map the areas of high ecological value in the Baltic Sea using both harmonized methodology and data sets: [80]

- Develop a common approach for habitat mapping and modelling (using EUNIS or HELCOM HUB classification system).
- Define common criteria to identify areas of high ecological value (including benthic habitats and areas important for birds, mammals, fish spawning and nursery etc.).
- Coordinate the collection of relevant data sets to develop a common map.

77 See Baltic SCOPE Recommendation on Environment no. 2.

78 See Baltic SCOPE Recommendation on Environment no. 5.

79 See Baltic SCOPE Recommendations on Environment no. 2 & 7.

80 See Baltic SCOPE Recommendations on Environment no.1 & 7.

Target group: a future joint international project involving national institutional actors providing access and handling relevant data, research institutions.

Develop cross-border harmonized data sets on the distribution of species and habitats with high value, with an emphasis on those most threatened by human activities in the sea. [81]

Target groups: future joint international project involving national marine data institutions.

d) Addressing a new challenge: climate change

A new challenge, where approaches, evidence and institutional frameworks are still under development is climate change. This is expected to strongly modify marine ecosystems and coastal areas, even more so in interaction with other human mediated stressors. For example, increasing water temperature and rainfall and decreasing ice cover change the ecological conditions for species and habitat distribution and consequently impact MPA networks as well as commercial fisheries. Approaches to address the impacts and risks of climate change for marine activities still have to be developed.

RECOMMENDATION

Special attention should be given to include a climate change perspective into MSP.

Target group: MSP authorities

7.2. CHALLENGES AND RECOMMENDATIONS TO INTEGRATE ENERGY PRODUCTION AND DISTRIBUTION INTO MSP FOR THE CENTRAL BALTIC SEA

Based on discussions in the project, stakeholder meetings and analysis of interactions within and around the energy sector, the following issues have been identified as important for the development of energy facilities and infrastructure at sea, which can impact the integration of the sector into MSP:

- Putting in place a balanced overall legal framework for the development of the energy sector in general and support for renewable energy in particular (both EU and national level).
- The development of new generating capacities and the replacement of existing ones to balance energy demand and supply while aiming at increasing the share of renewables in energy production.
- A need for the prompt implementation of infrastructure projects according to energy security needs.
- Strengthening regional and local transmission networks by connecting them with other EU countries and making it possible to accommodate renewable energy based electricity (TEN-E initiative[82], BEMIP[83], ENTSO-E[84]).
- Achieving early and effective coordination of interests across sectors.
- A need for a system that facilitates the early exchange of information on spatial plans and projects with transnational impact among all relevant stakeholders.

Based on this, MSP can both accelerate and inhibit marine energy development – depending on

81 See Baltic SCOPE Recommendations on Environment no.1 & 7.

82 Trans-European Energy Networks http://ec.europa.eu/transport/themes/infrastructure/index_en.htm

83 Baltic Energy Market Interconnection Plan. https://ec.europa.eu/energy/en/topics/infrastructure/baltic-energy-market-interconnection-plan

84 European Network of Transmission System Operators (ENTSO-E), including Ten Year Network Development Plan https://www.entsoe.eu/Pages/default.aspx .

its politically defined overall objectives and different countries' needs and defined sector priorities at different levels (e.g. a systems' total power) and the relationship of the MSP procedure and different procedures in the energy sector. From a pure energy perspective, and as energy is a relatively new marine use, the role of MSP can be seen reserving possible areas for energy related development and links to the onshore grid. Here, energy competes and can be in conflict with a number of already established uses (e.g. shipping, environment, defence). This also works the other way around, as ecosystem effects are currently evaluated late in the energy planning process, in connection with concrete projects. From the above sector-related issues and needs the following challenges and recommendations for including the energy sector into MSP can be formulated:

a) Including marine energy production and distribution planning in transboundary MSP

MSP faces the challenge of contributing to a more effective planning of sea-based energy production and distribution – based on increasing political pressure to become less dependent from fossil energy – while striking a reasonable balance when prioritising the use of marine space across sectors and remaining within environmental limitations. Moreover, while providing predictability of establishment for economic actors, MSP still needs to remain flexible in relation to technological innovation in the energy sector (changing spatial needs and other impacts).

RECOMMENDATIONS

Use MSP to assist and promote the development of a pan-Baltic perspective for the energy sector. National MSPs can be used to develop possible scenarios of OSW energy structure in the whole Central Baltic area to illustrate maximal, minimal and optimal possible production capacity. This will play an important role in planning Central Baltic countries' energy portfolio in medium and long term.[85]

Target groups: future MSP projects, MSP authorities and sector planners, policymakers, Baltic LINes, energy sector.

The development of energy infrastructure needs to identify both potential synergies and possible negative trans-boundary cumulative effects on the environment (e.g. bird migration routes, fish spawning grounds and protected biotopes) and other sectors (fisheries, shipping etc.). For this purpose, the Baltic SCOPE Conflict and Synergy matrices from both the Central Baltic and the Southwest Baltic case studies can be a starting point. However, more comprehensive models and approaches should be developed.

Target groups: MSP authorities, sector planners and policymakers.

b) Institutional challenges when including the energy sector into MSP

Presently, in its strategic planning, the energy sector works mostly in isolation from other sectors, even if it does have transnational communication structures to coordinate planning and activities. To achieve an early mobilisation and involvement of the energy sector in MSP consultations and bring them together with all relevant stakeholders from other sectors and national boundaries within MSP remains a challenge.

RECOMMENDATIONS

Introduce the BEMIP RES[86] Working Group to national MSP and to the conclusions of the Baltic SCOPE project and maintain regular exchange of information with the BEMIP RES Working Group about MSP issues.

Target groups: future MSP projects, MSP authorities and policymakers.

85 Project recommendation on Energy no. 1.

86 Baltic Energy Market Interconnection Plan Renewable Energy Sources, See https://ec.europa.eu/energy/en/topics/infrastructure/baltic-energy-market-interconnection-plan.

In order to ensure efficient transboundary discussions between two neighbouring countries, there is a need to include important energy sector stakeholders such as TSO and BEMIP. To improve the exchange of information in a proper way and time, informal routes of communication should be established between the relevant authorities and key stakeholders. Possible ways to operationalize this are: drawing up a common list of relevant stakeholders or agreeing on channelling such information via the central national MSP coordinating institution (ministry, agency, other) as contact points.

Target groups: MSP authorities, & TSOs, Baltic LINes (stakeholder list).

The construction of the interconnections within the Central Baltic is determined by the European network of transmission system operators for an electricity plan approved for the 10-year perspective. This network development plan is the official framework used for coordinating activities and legitimises EU co-financing for energy infrastructure projects that have significant national, regional or cross-border impact. The plan is regularly reviewed and updated to reflect the development and needs of the European energy system.

RECOMMENDATION

At present, with the absence of the national MSPs in the Central Baltic area, ecosystem aspects are evaluated quite late in the project stage, although they should be carried out at the proposal stage, when the national TSO begins preparing its submission.

Target groups: MSP authorities & TSOs.

c) Planning evidence and data needs

Following the above-mentioned recommendations about the future of offshore energy development and the necessary early warning of cumulative effects, whether positive or negative, are an important challenge for both the energy sector and MSP. In fact, cumulative effects are almost inevitably of a trans-boundary nature. And in the context of getting the most gains from the MSP process in the Baltic Sea region countries it is important to take existing, approved and planned infrastructure of neighbouring countries into consideration, as well as the potential cumulative effects on the environment and other sectors of the combined development. Here cross-border and comparable data are the precondition for the cumulative effects assessment of OSW farms. Thus, high quality data on biological diversity, which are comparable between countries (e.g. agreed minimal amount of needed data) are very important for any development project and need to be available as early as possible.

The priority of the energy sector in MSP between the environment, shipping and fisheries may vary according to specific national objectives. Qualitative information on the interests of other sectors in the cross-border context is the most important prerequisite for the development of OSW facilities.

7.3. CHALLENGES AND RECOMMENDATIONS TO INTEGRATE FISHERIES INTO MSP FOR THE CENTRAL BALTIC SEA

Based on discussions by the expert group and topic leaders and on conclusions from discussions at stakeholder meetings, the following key challenges related to the inclusion of fisheries were identified:

Fisheries, as a more traditional activity, is likely to be affected by other, expanding uses of the sea, which will most likely imply decreasing spatial flexibility for the sector – unless MSP reserves space. The main overall challenge of integrating fisheries in MSP is how to handle its highly dynamic characteristics related to both the resource, its market, and management needs. The areas important for fisheries vary over years, depending on the spread of the fish, stock size, and the conditions of the market. Moreover, as described in the environmental section, in the future, climate change is likely to affect spatial distribution of habitats and fish species. Fish as a

resource is dynamic; fish migrate, spawn and nurse in patterns that are hard to translate into clear designations on national Maritime spatial plan maps. Similar dynamics and complexity can also be found among the users. In Baltic SCOPE, fisheries has been presented and discussed by referring to various segments (different types of trawling and passive gear) with different activity areas (coastal or open water), including seasonal variations.

Summing up, the challenges of including the fisheries sector into MSP are of the following types and related to a) the dynamics of the resource as such and the complexity and dynamics among users including their societal drivers (e.g. market, regulation), b) the relevant (still developing) institutional frameworks whose interrelations with MSP are not yet fully understood and harmonized and c) the resulting incomplete and fragmented data situation in relation to all of this.

a) Challenges to include fisheries as a sector into MSP

RECOMMENDATION

Overall, the dynamics in fisheries highlight a need for planners to keep a dual perspective on fisheries in MSP. This means that designations of fisheries interest areas and important routes to landing ports should be combined with a general view that fisheries takes place outside these areas too (most of the stocks in the Central Baltic Sea are distributed at a pan-Baltic level) and priority areas may be subject to change. To consider the dynamics it is important to include all areas and aspects of fisheries in economic, social and environmental assessments of Maritime spatial plans.[87]

Target groups: MSP authorities, fisheries management authorities, fisheries sector, environmental NGOs.

b) Institutional challenges

The role of MSP in relation to fisheries needs to be clarified further. EU's CFP shares with MSP that implementing an ecosystem-based approach to achieve sustainable Blue Growth is a main management objective. MSP is defined as an ecosystem-based spatial management tool, while the CFP is by definition the common policy for ecosystem-based sustainable use of EU fishery resources. In this context, MSP makes an instrument enabling Blue Growth in fisheries, where common fish resources are used sustainably and efficiently. MSP balances space at sea between new uses and the achievements of established sectors such as the CFP objectives of sustainable use of the common fishery resources. One of the views expressed in the topic paper on fisheries is "the role of MSP is to allocate marine space suitable for environmentally sustainable and economically feasible fishing operations based on a CFP principle of equal access to fishing waters".

RECOMMENDATION

Institutional analysis and clarification is needed for including spatial aspects of fisheries in MSP. It is important to agree on a common methodology to represent important habitats for stocks, which have a distribution at a Pan-Baltic level.

Target groups: MSP authorities, fisheries management authorities, fisheries sector, researchers.

c) Challenges of planning evidence and data to integrate fisheries in MSP

The challenges due to the temporal and spatial dynamics in fish stocks and fisheries affect scientific understanding and data collection. Data producers struggle to get a full coverage of fish habitats as well as fishing activities, needed to develop planning evidence to assist spatial designations in MSP. This has resulted in the use of different methods for mapping fisheries among participating

87 See Baltic SCOPE General Recommendation on Planning Evidence No. 2, 4 and 5.

countries regardless of internationally established methods e.g. developed/used by the ICES. Altogether, this is challenging, when aiming to produce coherent maps of fisheries for the Baltic Sea, which are important for MSP to handle this transboundary sector properly.

Moreover, not just status, but also the evaluation of policy outcomes is challenging. For example a reformed CFP would need to find improvement in fish stock followed by a positive development in the fisheries sector. However, there are difficulties to predict future fisheries regarding type (passive/active gears) and targeted species. These are due to a lack of projections of future needs of the sector and to a lack of knowledge on how current fishing methods affect the ecosystem. Further uncertainty is added by the effects of climate change.

RECOMMENDATIONS

Including fish reproduction areas/EFH in MSP:

Map essential fish habitats for species of interest to fisheries in the whole Baltic Sea (e.g. spawning and nursery areas).[88]

Target groups: national agencies responsible for fisheries data collection and processing, ICES

Displaying fisheries interests in MSP:

Identify and show important fisheries areas also outside national EEZs[89]

Target groups: national fisheries research institutions, ICES Working Group on Spatial Fisheries Data (WGSFD)

Displaying fisheries interests in MSP:

Consider the spatial dynamics of fisheries as conditions and important areas change over time.[90]

Target groups: national MSP authorities, national agencies responsible for fisheries management and data collection and processing, and ICES.

Developing methodology: [91]

Discuss and agree with the ICES WGSFD on a methodology to improve usability of aggregated data for national MSP, taking into account transboundary aspects. Issues regarding the overall use of data source should be included in this discussion, to stress the favourable features regarding catch detail in the Electronic Reporting System for MSP (compared to VMS proxy).

Strive for coherence regarding input data and visualization of fisheries among Baltic Sea countries. There are two possible ways forward: 1) to develop a common methodology and common map for the Baltic Sea region's fisheries interests, which will later be used as a basis for the planning of cross-border issues. Another solution is 2) to agree on cooperation between countries for data exchange. In case of data exchange a country, interested in sharing their own fisheries interests with other countries EEZ, submits data in the form required (in accordance with others countries methodology, time period etc.) by the other country, so data sets would provide comparable information.

Target groups for both: national MSP authorities, national agencies responsible for fisheries data collection and processing, ICES.

88 See also sector project recommendations on Fisheries No. 1.

89 See also sector project recommendations on Fisheries No. 3 & 4.

90 See also sector project recommendations on Fisheries No. 5.

91 See also sector project recommendations on Fisheries No. 2.

7.4. CHALLENGES AND RECOMMENDATIONS TO INTEGRATE SHIPPING INTO MSP IN THE CENTRAL BALTIC SEA AREA

Based on discussions among planners, the stakeholder meeting and the work of shipping and other experts, a number of key challenges related to the inclusion of the shipping sector into MSP were identified. They are related to a) institutional and coordination issues – shipping is essentially a transboundary issue, b) sector characteristics in relation to MSP and c) data needs. Below, they are presented, in combination with recommendations on how to overcome them.

a) Challenges of including shipping as a sector in MSP

Shipping is a well-established use of marine areas with shipping lanes, navigation rules and other procedures in place. It requires marine space in the form of shipping channels and direct vessel routes for different types of shipping such as cargo and passenger traffic for different size of vessels, offshore and coastal fisheries and recreational shipping with small crafts and for water sports (wind surfing, motorsport). Intensive shipping areas, especially in border areas, must be planned carefully, in order to avoid ship collisions (traffic separation schemes) and potential environmental impacts (competition with MPAs, ecologically vulnerable areas). Insufficient space planned for shipping operations implies higher risks from a maritime safety perspective.

Shipping lines cross boundaries. Possible re-routings are not only national matters, but may impact neighbouring countries' competitiveness of the shipping sector or safe navigation (impacts with permanent structures).

Developments on the mainland influence spatial developments at sea. If there are no ports and little connections to the road and railway system, a coastal region will be avoided. So, land-sea interactions impact the objectives set for the shipping sector. For the transport of great volumes of cargo and passengers the necessary infrastructure has to be available on land.

Shipping lanes, water traffic areas etc. impact other marine uses and vice versa. Marine use cannot be planned without looking into these implications. Intensively used shipping routes can affect areas of high ecological value negatively. The energy sector competes with the shipping sector through the installation of permanent structures, namely OWF, and potentially in the future with wave energy. Shipping disturbs fisheries also through noise and pollution (essential fish habitats, spawning and nursery areas).

RECOMMENDATIONS

Conflicts with the shipping sector in a trans-boundary context can be solved by an enhanced and timely exchange of information and plans. Route adjustments in Maritime spatial plans can be valuable steps towards necessary changes, as they indicate political intentions and provide a transparent and informative basis for further discussions.

Target groups: national MSP authorities, national maritime administrations, and national environmental institutions.

It is important to ensure that safety at sea and navigation requirements are adequately addressed during preparation and planning. Authorities with the mandate to represent the sector abroad should be involved.

Target groups: national MSP authorities, maritime administrations.

b) Institutional challenges of including shipping into MSP

The project has made clear that the approach to shipping in MSP varies among countries. The differences come from the distribution of shipping and the type of zoning. It may not be necessary to have a common approach in defining the shipping interest in MSP, but the differences should be understood and acknowledged across borders for effective coordination and alignment, and to make cross-border cooperation as effective as possible.

To deal with cross-border aspects of shipping, common criteria or classification of shipping lines is needed in order to understand their importance and transnational value. Medium size ferries cannot be treated in the same way as international cargo interests. Minimum criteria for internationally significant shipping routes should be agreed upon.

RECOMMENDATIONS

Ensure that shipping related differences in MSP are discussed and equally understood by national Maritime administrations, in order to build ownership for a successful implementation of MSP.[92]

Target groups: national MSP authorities, maritime administrations.

The centre lines of Latvia's "reserved zones for shipping", Estonia's "future water traffic areas and planned route of small ships" and Sweden's "areas of national interest for shipping" should be logically connected by forming a coherent approach to connect linear shipping routes. The most important shipping lines have to be coherent across the borders and connection gaps should be avoided.

Target groups: national MSP authorities, maritime administrations.

There are differences in terminology for describing and managing shipping. This needs to be harmonised or at least made understandable between the countries.

RECOMMENDATIONS

Discuss and understand the differences in shipping route planning approaches in different countries during the planning process. [93]

Target group: national MSP authorities.

National decisions in the shipping sector and MSP on rerouting or other activities concerning shipping should be consulted across borders at the earliest possible stage. If possible, proposed rerouting of IMO lines should already be analysed in the MSP process to take into account the needs of other sectors and various stakeholders. This would ensure a coherence of plans, at all stages of the process.

Target groups: national MSP authorities, sector stakeholders, project Baltic LINes.

Involve the authorities that have the mandate to represent the shipping sector abroad (particularly national maritime administrations) to the national MSP process, so that the developments in one country could be analysed in the neighbouring country.

Target groups: national MSP authorities, maritime administrations.

92 See Baltic SCOPE General Recommendation on Stakeholder involvement no. 2-5.

93 See Baltic SCOPE General Recommendation on Planning Evidence no. 3 & 5.

c) Challenges in relation to planning evidence and data needs

Harmonised and good quality data on maritime transport is important, but not necessarily readily available, as it is spread across different actors.

RECOMMENDATIONS

A common Baltic map on areas of high ecological value should be developed. It is also essential for planning shipping routes, as it can help minimise the impacts of shipping accidents and oil spills.

Target groups: national MSP authorities, maritime administrations, national environmental institutions, research institutes.

Conditions for exchange of basic data sharing between Hydrographic services on their existing international platforms should be agreed between countries for MSP purposes.

Target groups: national MSP authorities, sector stakeholders, HELCOM-VASAB MSP data sub-group.

When analysing transboundary conflicts and synergies, further international organizations and stakeholders (IMO, HELCOM etc.) should be involved in ensuring a harmonized representation of shipping data.

Target groups: HELCOM-VASAB MSP data sub-group, national MSP authorities.

7.5. CONCLUSIONS AND OUTLOOK FROM AN OVERALL CENTRAL BALTIC PERSPECTIVE

The Baltic SCOPE project has been a fantastic opportunity to develop broader cooperation across national MSP processes in the Central Baltic countries. As intended, the numerous discussions between planners and sector experts successfully established a mutual understanding of developments in important marine use of different sectors in the Central Baltic Sea. One can say that a foundation for meaningful and longer lasting cooperation and more harmonized plans has been created. In addition, one has succeeded in understanding each other's differences better. There was never the intention, and it does not appear meaningful, to develop the synchronization of national marine plans. The participating countries' approaches are different, their priorities are different and to some extent they will remain so. Moreover, the involvement of national stakeholders seems to have provided those stakeholders with a deeper understanding of their role in MSP and a motivation to become active participants in Maritime Spatial Planning.

However, for a well-functioning transboundary MSP in the Central Baltic, some important obstacles still need to be overcome:

- Maritime Spatial Planning is still a rather new concept and approach. It is questioned and tested, not the least in comparison with traditional sector-internal planning. Notably, there is still a lack of understanding of responsibilities among sector stakeholders i.e. who will do what. This becomes even more complicated in a transboundary context, because the right to plan, as far it aligns with international agreements and regulations, belongs to the national state. Thus, designing geographically precise marine spatial plans remains a challenge. MSP is not only about prioritizing through zones; it includes also other types of management proposals, especially within environmental management.

- Also an ecosystem-based approach has so far not been properly adopted and implemented the whole way; different countries are making their first attempts in using the best available data to define the sensitivity and values of marine ecosystems. Here, a common approach to evaluate cumulative pressures of different sectors is one of the major future challenges. Moreover, an assessment of the coherence of MPA-networks in the Baltic Sea is needed. The questions of how exactly MSP can improve the coherence of MPA-networks still needs to be clarified.
- Data and information exchange between countries faces limits through national data dissemination rules and a lack of common standards for data content and visualisation. Informal exchange of information still prevails. Thus, it would be necessary to create a common data platform for the future. It is technically feasible to combine digital information, but requires agreement between all countries of the Baltic Sea region on the standards of data content and viewing. It would be reasonable to use the results of the HELCOM-VASAB Maritime Spatial Planning Data Expert Sub-group[94] and other relevant projects, such as BalticLINes as a basis to develop a pilot project for a Baltic Sea regional data platform.
- In the future different timelines for national MSP processes will also complicate the cross border exchange of knowledge and data. Therefore, European DG MARE projects will continue to play an important role in strengthening the collaboration between countries. The three Central Baltic countries are at different stages of their national MSP. Only, when a first generation of national plans will be ready will it be possible to analyse/ evaluate the different approaches. Meanwhile, collaboration-projects like Baltic SCOPE, make it possible to exchange ideas and take a few further steps forward towards further integration of sectors and across boundaries.
- Language barriers: if first marine spatial plans are available only in national languages, early transboundary cooperation cannot occur. Ideally, it would be necessary to translate all documents of all marine planning stages at least into English.
- A development of a common methodology for criteria or standards is possible only if a transnational process (formal or informal) is initiated, within which experts and countries agree on certain actions. This kind of initiative can be carried out under the auspices of organizations such as VASAB and/or HELCOM, involving sector organizations, such as ICES, IMO, or through collaborative projects. An officially institutionalised and permanent mechanism for cross-border coordination in practice is needed. Without these institutionalised mechanisms for MSP, many results and proposals from projects will not be viable and sustainable in the long run.
- If the present project based and ad-hoc cooperation on specific conflicts of sea use is going to continue, it is likely to become difficult to find "coherence" between national Marine Spatial plans and evaluate them. Furthermore, such cooperation tends to only solve perceived present problems and be less proactive and strategic such as MSP should be.

Baltic SCOPE has already come far, but there is still work ahead to further develop transboundary MSP in the Central Baltic area. For this purpose, it is especially important to tackle the above issues. The collaborative spirit, the enthusiasm and the experiences developed in the project make a valuable base from which to continue to successfully address these issues. Last but not least, the Planners' Group strongly suggests implementing the overall Baltic SCOPE project recommendations including the ecosystem-based approach toolset; these have been developed on the basis of their work and the of case-specific recommendations presented here.

94 See http://www.vasab.org/index.php/maritime-spatial-planning/bsr-msp-data-esg.

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NOTES

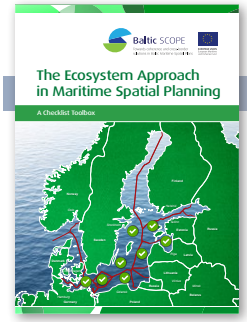
LIST OF THE PRODUCTS PREPARED DURING THE BALTIC SCOPE COLLABORATION:

Recommendations
on Maritime Spatial Planning Across Borders

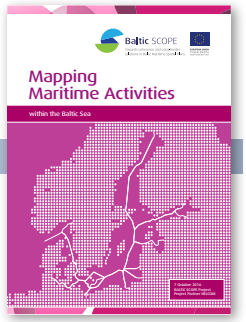
Coherent Cross-border Maritime Spatial Planning for the Southwest Baltic Sea -
Results from Baltic SCOPE

Towards Coherent Cross-Border Maritime Spatial Planning in the Central Baltic Sea - Case Study Report From the Baltic SCOPE Project

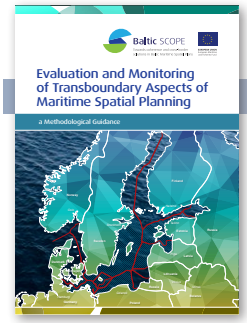
Lessons Learned: Obstacles and Enablers When Tackling the Challenges of Cross-Border Maritime Spatial Planning - Experiences from Baltic SCOPE



The Ecosystem Approach in Maritime Spatial Planning - A Checklist Toolbox



Mapping Maritime Activities
within the Baltic Sea



Evaluation and Monitoring of Transboundary Aspects of Maritime Spatial Planning -
a Methodological Guidance

Development of a Maritime Spatial Plan:
The Latvian Recipe

Get them at www.balticscope.eu

Joint results achieved by cooperation between the authorities responsible for Maritime Spatial Planning in the Baltic Sea Region with support of regional and research organizations.

Swedish Agency for Marine and Water Management

Nordregio

BSH Bundesamt für Seeschiffahrt und Hydrographie

SYKE

Ministry of Environmental Protection and Regional Development Republic of Latvia

VASAB Vision & Strategies around the Baltic Sea

HELCOM

Danish Maritime Authority

Republic of Estonia Ministry of Finance

Baltic SCOPE

Towards coherence and cross-border solutions in Baltic Maritime Spatial Plans

European Union
European Maritime and Fisheries Fund

WWW.BALTICSCOPE.EU

EU Strategy for the Baltic Sea Region Flagship