BaltSeaPlan Report 9

Developing a Pilot Maritime Spatial Plan for the Pomeranian Bight and Arkona Basin

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Glossary of Terms

BSH	Federal Maritime and Hydrographic Agency Germany
DE	Germany
DK	Denmark
EEZ	Exclusive Economic Zone
HELCOM	Helsinki Commision
IMO	International Maritime Organisation
MPA	Marine Protected Areas
MSP	Maritime spatial planning
M-V	Mecklenburg-Vorpommern
PL	Poland
SE	Sweden
SEA	Strategic Environmental Assessment
TEN	Trans-European Networks

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Contents

Executive summary

This report presents the result of a pilot project carried out as part of the EU-funded BaltSeaPlan project (2009-2011). A team of experts with diverse professional backgrounds worked over a period of two years to draft a pilot transboundary maritime spatial plan for a sea area in the Pomeranian Bight/Arkona Basin. The draft spatial plan is the result of a planning exercise which took place outside the formal planning processes as legally binding agreements already exist for the German EEZ and the territorial waters of Mecklenburg-Vorpommern. Working with diverse stakeholders in Poland, Germany and Sweden, **the aims were (1) to identify the main conflicts of use in the pilot area, (2) bring together transboundary approaches for dealing with these, and (3) develop a draft maritime spatial plan that actively supports the principle of sustainable maritime development.** Apart from generating tangible output, the pilot project was also a test case of working with the MSP planning cycle across national borders, bringing together four different planning systems and traditions in the attempt to come to joint solutions in a sea area faced with multiple pressures.

In line with the MSP planning cycle (PlanCoast 2008), the first stage was to provide the necessary **context** for the MSP exercise by describing the natural and the socio-economic environment of the pilot area. Although no full SEA was carried out, available information was brought together on sea bed morphology and bathymetry, salinity, ice conditions, wind conditions, as well as natural assets such as sea birds, fish and harbour porpoise. This was complemented by a description of demographic trends, the economic situation in the respective coastal regions, international legislation affecting the pilot area, and the existing spatial planning framework in the respective countries (including regional strategies and other relevant policies). At the same time, stakeholder processes were initiated in the various countries with a view of involving stakeholders in the process of identifying conflicts in the pilot area. This involved identifying relevant stakeholders, contacting them with a short questionnaire on current uses and conflicts experienced, and stakeholder meetings at various stages of the project.

The second stage was to carry out a comprehensive **stocktake of current uses** together with a brief overview of the trends and developments expected in these. This focused on transnational uses that extended across the entire pilot area and included shipping, nature conservation, offshore wind farming, tourism, fisheries, and sand and gravel extraction. Based on the stocktaking maps, conflicts were identified by the planning team. The stocktaking maps were then presented at stakeholder workshops carried out in Germany and Poland, where the conflicts were further discussed and refined. Particular conflicts were found to arise between nature conservation and sea uses (e.g. cables and pipelines, sand and gravel extraction), shipping and offshore wind farming, tourism and offshore wind farming, and nature conservation and fisheries.

The third stage was to **test various methods for spatially dealing with the conflicts identified**. All these are examples only, which are presented here as potential contributions to decision support. Marxan software was successfully applied to identify potentially suitable areas for offshore wind farming and fishery zones, providing a range of scenarios that can now be further discussed and fed into the decision-making process. An example from Mecklenburg-Vorpommern illustrates the difficulties encountered in identifying suitable areas for offshore wind farming in the territorial sea. An example is also provided on how to identify spatial conflicts between seabirds and shipping.

The final step was to **draw up the draft spatial plan** for the pilot area. This firstly meant defining general objectives for each of the uses identified in the stocktake. For shipping for example, a key objective is to promote safe and clean shipping and port development and reduce the collision risk in dangerous goods transport. For energy, a key objective is to find suitable areas for offshore wind farms. Objectives were also defined for tourism and nature conservation. Zoning then translates these general objectives into area categories, which enhance or restrict certain sea uses bearing in

mind the specific potentials and opportunities and problems and risks of each sea use. To enhance compatibility with the BaltSeaPlan Vision the following types of areas were used:

Priority areas: no use is allowed that would significantly constrain the use that is given priority in this area.

Reservation areas: a certain use is given special weight in the process of balancing the competing interests in the area. The difference to priority areas is that it is not certain that the use receiving specific attention has absolute priority.

Suitable areas: an activity is exclusively assigned to respective suitable areas which have been chosen along a range of parameters – outside of these areas the activity is not allowed and not licensable.

Open use areas: no use has priority and all uses other than those restricted to suitable areas are allowed.

The draft plan makes clear that not all of the conflicts identified can be dealt with by means of MSP alone and that management plans are necessary for achieving certain objectives (e.g. fishery measures in Natura 2000 areas). Nevertheless, the defined area categories can be an orientation that should be considered when drafting sectoral development concepts and when awarding subsidies. Where appropriate, the draft maritime spatial plan is therefore complemented by recommendations for sectoral planning.

Internal evaluation showed the pilot project to be a success. Apart from the draft maritime spatial plan, valuable outputs include the development of a common understanding of the tasks involved in transboundary MSP and the objectives to be achieved (development of a common language), as well as the need for effective working and decision-making structures. But the difficulties encountered also offer important lessons. Data availability and the spatial relevance of data was one difficulty, as was the uneven distribution of partners (not every country was represented by spatial planners), insufficient time for the last planning steps, and differences in planning cultures and 'philosophies'. Recommendations are offered for similar projects in terms of the planning process (how to work across different planning cultures effectively) and in terms of the resources required (partners, staff time, hardware, software, regular meetings, data accessibility and compatibility etc).

1. Introduction

The Baltic Sea is a dynamic economic region with growing competition between a wide range of sea uses. At the same time, limited sea space and the valuable, sensitive marine and coastal ecosystem call for a considered approach to future development. Maritime spatial planning (MSP) is a tool for facilitating this at various spatial levels. Its purpose is to find solutions for the sustainable use of maritime space, balancing social, economic and ecological interests in a manner that does justice to all three. MSP achieves this by taking a cooperative and participatory approach involving various stakeholders.

Systematic MSP has so far been limited, in particular where transboundary maritime spatial planning is concerned. Countries have different planning systems and approaches, and there are no established mechanisms as yet for facilitating MSP across borders.

The pilot project was one of several pilot projects carried out as part of the EU-funded project BaltSeaPlan (2009-2011) (Fig. 1). The pilot project area was chosen because of the multiple transnational issues coming together here and the challenge of working with the planning systems and 'philosophies' of four countries. The objective was to draft a pilot transnational maritime spatial plan for an area extending between Poland, Denmark, Germany and Sweden.

This report documents the various steps taken by the planning group, together with the achievements and difficulties experienced during the process. It also provides a thorough description of the planning area, an overview of current issues and conflicts and the planning principles upon which the draft plan is based.

The experience serves as a test case for cooperation in MSP across borders. It hopes to provide useful lessons for other, similar processes and lay the foundation for an 'official' transnational planning exercise at a later stage.

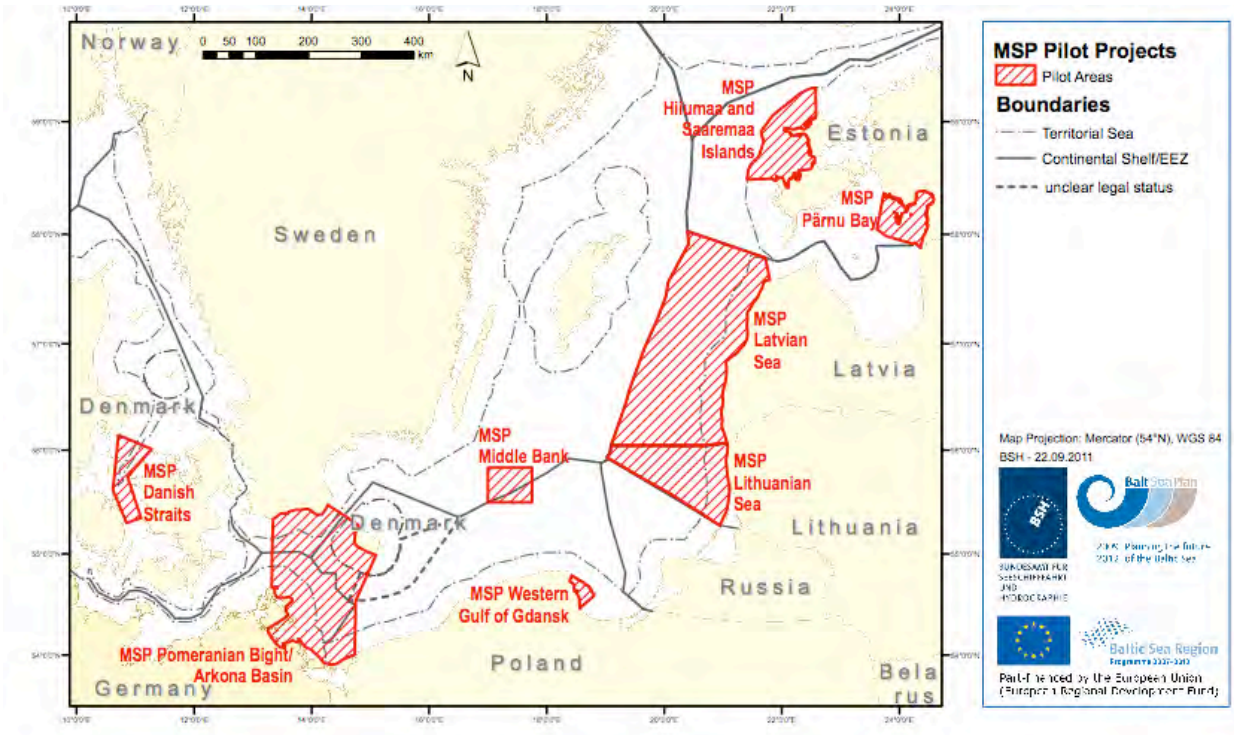

Fig. 1: *Overview of BaltSeaPlan pilot projects*

It must be pointed out that the proposal for the maritime spatial plan presented here was drawn up as an informal exercise, taking place outside the formal planning processes. Legally binding agreements already exist for the German EEZ[1] and the territorial waters of Mecklenburg-Vorpommern[2]. It should also be pointed out that not all relevant stakeholders could be involved in the planning exercise. Since this was a pilot exercise, the planning process started with a level playing field, taking a fresh look at the issues to be resolved and possible solutions without being constrained by existing plans.

The planning team comprised a wide range of experts with backgrounds as diverse as marine biology, spatial planning, GIS, fisheries management, law, policy and geography. It included:

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[1] http://www.bsh.de/en/Marine_uses/Spatial_Planning_in_the_German_EEZ/index.jsp
[2] http://www.mv-regierung.de/vm/raumordnung/aktuell_neuaufstellung_karte_CMS.html

2. Planning organisation and stakeholder involvement

2.1 Pre-planning: General aims of the pilot project

From the beginning, it was clear that the planning exercise would be an informal exercise to take place outside the formal planning processes, as legally binding plans already exist for the German EEZ and for the coastal waters of Mecklenburg-Vorpommern. Nevertheless, the overarching aim was to **develop a 'real life' maritime spatial plan** for the project area based on the sustainability principle, seeking to balance economic, ecological and social demands in a way that does justice to them all. Drawing on the existing Gdansk Bay pilot MSP, partners agreed on the following core principles for the plan:

- Facilitating the sustainable development of coastal communities,
- Ensuring the good condition of coastal and marine ecosystems by implementing the ecosystem approach as part of sustainable development,
- Ensuring the safe and sustainable use of marine resources,
- Enabling economically-sound management of sea space, leaving enough place for unknown uses and non-uses,
- Ensuring the preservation of historical heritage,
- Regulation by means of zones not only in space but also in time.

The first stage of the pilot project was **to gain an overview of the main ecological characteristics** and key **demographic and socio-economic influencing factors** with potential impact on the pilot area. Land-based and marine information was drawn together from all four countries. **A more detailed stocktake of uses** was then carried out to identify the main patterns of use in the pilot area, which in turn served as a basis for pinpointing conflicts of use.

Much existing legislation already applies to the pilot area, with a scattered legal framework and responsibilities for maritime spatial planning within and between countries. There are also pending debates about country boundaries in the 12nm-zone and the EEZ. At the process level, another aim of the pilot project was therefore to address the following questions:

- How can a successful joint planning process be organised despite the scattered responsibilities?
- How can different priorities and approaches to problems and conflicts be dealt with?

For the actual planning exercise, criteria would also need to be defined for zoning.

Partners agreed not to carry out **an SEA process in parallel to the MSP process.** Although MSP falls within the remit of the SEA Directive, it seemed too ambitious to go through a parallel SEA procedure within the limited project timeline.

It must be emphasized that the partners involved in the project represented various professional backgrounds and organisations. Not every country was represented by spatial planners for example. The ability of the partners to contribute therefore varied across the planning stages.

Overall aims of the pilot project

a. Developing a shared understanding of the aims and practice of transboundary MSP,

b. Identifying the current and potential conflicts arising from different marine use,

c. Identifying the respective priorities of the four national states for the respective sea areas,

d. Developing methods of stakeholder selection and specifying the role(s) of stakeholders in the process of drafting the plan,

e. Specifying the data indispensable for drawing up the plan correctly, including the system for gathering data, data availability and accessibility, and cross-border data exchange,

f. Specifying the issues that require cross-border cooperation not only between the neighbouring countries, but between all Baltic Sea countries. This might include shipping, infrastructure corridors, nature conservation, and renewable energy.

2.2 Getting organized

The process of drawing up the maritime spatial plan followed the steps set out in the PlanCoast handbook (www.plancoast.eu) (Tab.1). In parallel, steps were designed to facilitate stakeholder involvement as this was considered crucial for turning this into a 'real life' exercise. Given the limited resources available in the project and its status as a pilot project, the 'when' and 'how' of stakeholder involvement in this exercise was a tricky question. Common wisdom holds that stakeholder involvement should take place early, preferably before a draft MSP becomes available. On the other hand, experience in DE has shown that participation of stakeholders too early in the process can have negative effects, such as causing undue delays, complications in the formulation of goals, and the difficulties involved in meeting the expectations of each target group which are sometimes in extreme opposition to each other. There are also different frameworks for stakeholder involvement in the different countries. In PL for example the legal framework applying to terrestrial areas is such that public consultation has to begin the moment the preparation of a spatial plan is announced. In practice, exactly when stakeholders are contacted may also be determined by the need to request data from them.

Although some preparatory steps were clearly necessary early in the process (such as identifying the relevant stakeholders), it was decided to delay actual stakeholder involvement to the point where the stocktaking maps had become available (step 4). Comments on conflicts and further proposals can better be collected at this stage. All submitted opinions or expectations were to be treated seriously so as to not cause stakeholders to lose trust in the real process.

The overall work programme agreed for the pilot project is set out in Tab. 1. This methodological approach made sure the results of the various work stages build on one another and link with the stakeholder exercise in a sensible way. The work plan was also flexible enough to account for difficulties such as obtaining data.

Tab. 1: *Steps in drafting a maritime spatial plan for the pilot area*

MSP in the pilot project	Steps in stakeholder involvement
Step 1: pre-planning • Develop MSP work plan • Inform the authorities in charge and make sure they support the initiative • Delineate area where MSP is needed	Stakeholder mapping: Identify relevant stakeholders
Step 2: Context analysis and definition of aims and objectives for the pilot area • Define principles of MSP • Analysis of legal framework • Analyse the existing visions and strategies on international/ national/regional/local level	• Plan stakeholder involvement: define who should be involved when • Contact stakeholders: inform them about the planned MSP process and the detailed schedule.
Step 3: Stocktake (mapping exercise) • Collect information on natural assets and biodiversity • Socio-economic analysis • If needed produce new data, digitalise & harmonise it • Cover the different uses on separate layers	Obtain information from various stakeholders
Step 5: Conflict analysis • Matrix of current uses and natural conditions to identify the conflict hot-spots	First stakeholder meeting: • A professionally moderated workshop to discuss the different possible futures for the area. • Follow-up on the results to the participants
Step 6: Finding solutions • Build scenarios for specific issues • Delineate functional zones according to priorities set in step 3 • Set preliminary targets and measures for each zone	Second stakeholder meeting: • Discuss possible measures for each zone in small thematic groups. • Discuss the environmental impact of each measure
Step 7: Drafting the plan • Set the final targets, objectives and measures for each zone • Compile all ideas in a catalogue of measures (Management Plan) • Finalise the draft plan in both graphic and descriptive part • Make final adjustments of the plan	Public hearing: present the draft MSP and the SEA report to the authorities in charge of the MSP implementation.
Step 8: Implementation	not part of the pilot project
Step 9: Evaluation	carried out during the stakeholder process

Work was done at six project meetings organised over the course of the project period:

Project meetings:

16-17 November 2009, Szczecin, Poland

01-02 March 2010, Stralsund, Germany

16-17 September 2010, Dragör, Denmark

12 May 2010, Klaipeda, Lithuania

27 October 2010, Stockholm, Sweden

8–10 March 2011, Rostock, Germany

2.3 Initiating the stakeholder process

The form and timing of stakeholder participation differed across the four countries, as did the actual stakeholders involved. The original idea of organising a transnational stakeholder meeting could not be pursued due to time constraints at the end of the project. Stakeholder participation was thus limited to workshops carried out at the national level.

Identification of relevant stakeholders began early in the MSP process, with each partner compiling a national list of stakeholders either involved in the MSP process or potentially affected by the results. The Maritime Office in Szczecin identified over 60 significant stakeholders, comprising national, regional and local level institutions and authorities representing all relevant types of activity (complete stakeholder map not shown here). In Sweden, 90 authorities and scientists were identified (not shown here). German partners decided to specifically involve representatives of industry and NGOs in this project (12 contacts); in “real life” federal and regional agencies and administrations would also participate.

Stakeholders were then contacted with a short questionnaire, asking whether they were active in the pilot project area, were planning to become active, were experiencing conflicts or were expecting to experience conflicts over their activities. The response rate varied in the countries, ranging from 11% in Sweden (10 positive answers out of 90 authorities and scientists contacted), 25% in Poland (15 out of 60), and 75% in Germany (9 out of 12 contacted) In Sweden, the blanket approach to contacting stakeholders did not prove successful, leading to the conclusion that the topic and process needs to be interesting enough to engage people. Swedish stakeholders expressed greater interest in becoming involved in the pilot project Middle Bank, presumably due to the planned offshore wind park there.

Tab. 2: *Overview of stakeholders involved in Germany and Poland*

Sector/type of stakeholder	DE (contacted)	PL (responses received in questionnaire)
Ports	Federal Association of German Seaport Operators (ZDS)	Mrzeyno Sea Port Authority
Shipping	German Shipowners' Association	
Offshore wind farming	Offshore-Forum Windenergie GbR	
Recreation	German Sailing Association	
Science & Research	Leibniz Institute for Baltic Sea	

	Research Warnemünde (IOW)	
Nature conservation	Friends of the Earth (BUND) Germany, Federal Office, Regional Association Mecklenburg- Vorpommern	
	Conservation Federation of Germany (NABU), Regional Association – Regional Association Mecklenburg-Vorpommern	
	WWF – Baltic Sea Project Office	
Sand and gravel extraction	Verband der Seekiesindustrie e.V.	
Fisheries	German Fisheries Association	Sea Fishery Institute, research station in Świnoujście
	Johann Heinrich von Thunen-Institute, Department for Baltic Sea Fisheries (vTI)	District Sea Fishery Inspectorate in Szczecin
	Association of Trawl and Inshore Fishermen Mecklenburg – Vorpommern	
Trade and industry	IHK Rostock	
Tourism	Tourism Association Mecklenburg-Vorpommern	
Oil & Gas	Federal Association Mineral Resources (MIRO)	Petrobaltic LOTOS
		Gaz-system
Water management		Regional Water Management Authority
Research		University of Szczecin, Department of Earth Sciences, Marine Geomorphology Section
Local authorities		City Hall of Miedzyzdroje
		City Hall of Świnoujście, Dept. Of Architecture and Building
Regional authorities		West Pomeranian Marshal Office;
		Voivodship Environment Protection Inspectorate in Szczecin
		Regional Directrate for Environment Protection, Division for Strategic Assessment and Spatial Management
		West Pomeranian Voivod's Office/Province Office, Dept. of infrastructure;
		Regional Office for Spatial Management of West Pomeranian Voivodship; Regional Office of Spatial Management of West Pomeranian Voivodship
		Maritime Office in Słupsk

Unfortunately, the Danish partner was not in a position to work with stakeholders because of budgetary and time constraints. In Sweden, a new Sea and Fresh Water Authority was set to commence work from 1st July 2011; without an authority responsible for MSP, it was generally difficult to find the right partner for discussing the pilot project.

Initiating the stakeholder process in Poland:

"To initiate the stakeholder communication and involvement we utilized the questionnaire elaborated by Sweden and distributed an announcement to inform on the launching of preparation process of MSP for our pilot project area. E-mails with questionnaire were sent out to stakeholders from our list. The questionnaire was accompanied by cover letter containing basic information on BaltSeaPlan and MSP and Bulletin no 1 was also attached. In addition, information with invitation to participate in the open consultations and to submit comments, opinions and to fill in the questionnaire was placed on our website. Another efficient way to contact stakeholders is the internet, so we created a tab on our MOS web site dedicated to BaltSeaPlan where detailed information on MSP could be found and where documents such as newsletters, bulletin, flyer, questionnaire, etc. were made available in Polish. As a result 15 respondents out of 60 returned their filled in questionnaire."

As a next step in the stakeholder process, stakeholder meetings were organized in Poland (December 2010) and Germany (September 2011). The purpose of the meetings was to identify and/or confirm trends and developments in the pilot project area, and to highlight conflicts of interest. Attendance was generally high, with 34 stakeholders present in Poland and 9 in Germany (excluding BaltSeaPlan project partners).

The majority of stakeholders were already active in the pilot area or close by to it, and most also already experience conflicts or expect them to arise in the future (see chapter 5).

Fig. 2: *Stakeholder meeting in Rostock, Germany, 2 September 2011*

3. The planning context

A thorough description of the planning context is an essential requirement for drawing up a maritime spatial plan. This includes a description of the planning area, the natural marine environment, the socio-economic characteristics of the area, trends and developments, as well as relevant policies (international, national, regional).

The description of the planning context and the stocktake worked with so-called 'national shares', where every country contributed relevant information on their respective share of the pilot project area.

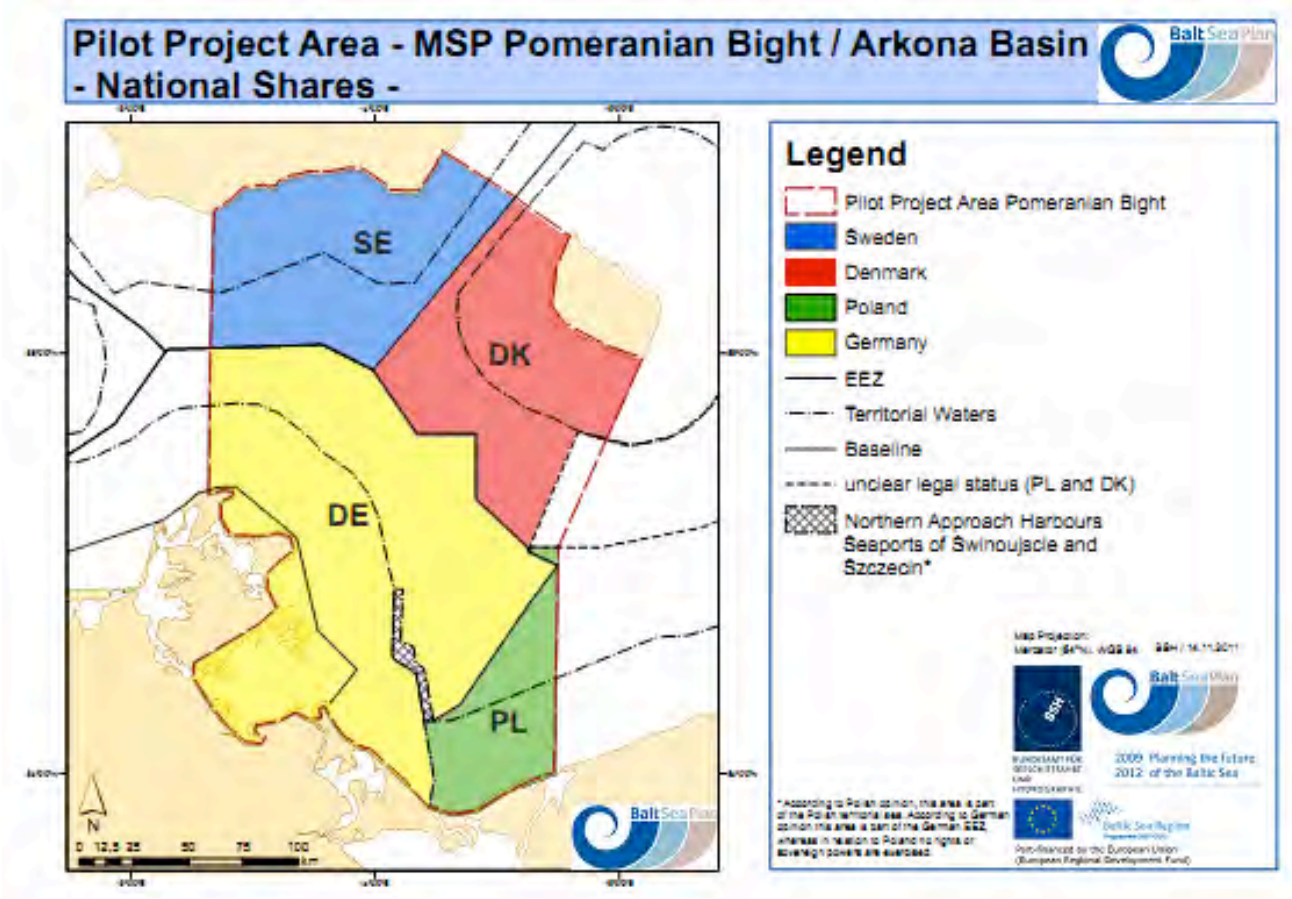
3.1 Delineating the project area

The area of the Pomeranian Bight/Arkona Basin pilot project comprises shares of the territorial seas and respective EEZs of Denmark, Sweden, Poland and Germany. Encompassing a total of about 14,100 km^2, its outlines are being defined by a line running southwards from south-western Bornholm to the Wolin peninsula (western coast of the Polish county of Zachodniopomorskie), from there to the headland of Arkona in Germany/ Mecklenburg-Vorpommern, then north to and along the Southern coast of Skane in Sweden, and finally crossing the Traffic Separation Scheme/IMO shipping route of Bornholms Gat back to Bornholm.

Delineating the exact extent of the pilot area was a key task at the beginning of the pilot project. Based on a first draft by BSH the partners eventually agreed on the area as shown on the map below (Fig. 2). In this context it was realised that there are contradicting legal opinions between Germany and Poland concerning the area of the northern approaches of the harbours of Świnoujście and Szczecin and anchorage No. 3. Also, the border between the Danish and Polish EEZ has not been agreed. The project was conscious of the fact that these problematic issues can only be resolved by high level decision-makers and not by this project. Nevertheless, a solution was needed that would be acceptable to all partners. It was decided that in the project maps the Northern approach/anchorage should be marked as a disputed area, and the border region between Denmark and Poland as having unclear legal status. For the planning process in the pilot project, this open situation can be ignored as long as it does not compromise the planning content.

Scale was determined by the need to fit the area into readable maps of A4, A3 or enlarged format for participation and exhibition purposes. Thus slightly generalised layers were used, e.g. for the European countries. Legends were initially adapted from existing maps on sea uses and MSP maps within the German EEZ. Later the common legend items developed for all BaltSeaPlan pilot projects were used.

This case shows that transnational consultation should be conducted at a very early stage of the MSP process in order to learn of and ideally meet the expectations of neighbouring countries and to avoid conflicts.



	N	E
1	54°59,36'	15°5,74'
2	54°32,51'	14°45,01'
3	54°0,20'	14°43,98'
4	54°13,76'	13°15,49'
5	54°16,02'	13°15,51'
6	54°40,06'	13°19,23'
7	55°0,79'	13°19,58'
8	55°20,17'	13°20,48'
9	55°28,46'	14°16,59'
10	55°22,01'	14°34,48'
11	55°16,61'	14°47,89'

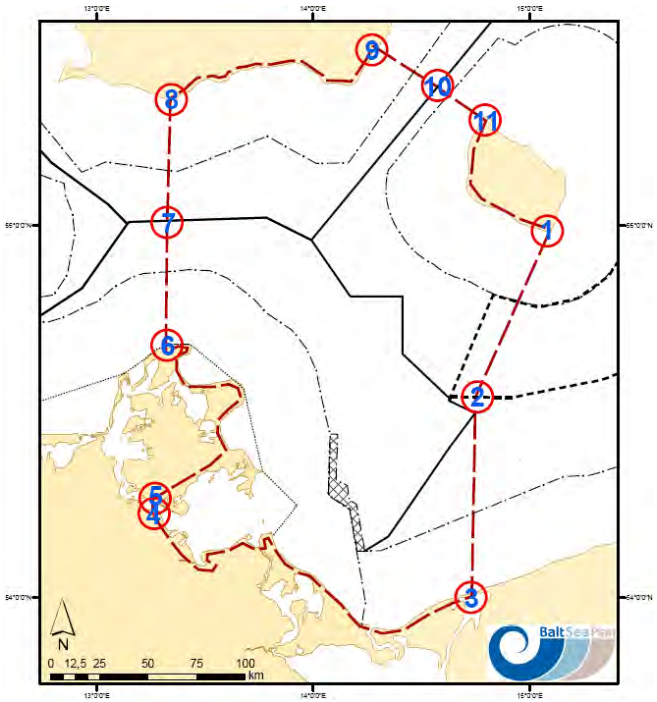


Fig. 2: The pilot project area

3.2 Natural environment, trends and developments

This report only outlines some basic aspects of the national environment and its state. A full SEA was not conducted. A comprehensive summary can be found in the SEA report for the Maritime Spatial Plan for the German EEZ of the Baltic Sea (BSH, 2009), chapter 2, "Description and Assessment of Environmental Status" (in German)[3]. Although it comprises the Arkona Basin and Pomeranian Bight as part of the German EEZ it also gives some information on the adjacent areas and thus within most of the pilot area.

3.2.1 Sea bed: Morphology, sediment, bathymetry

The pilot area has several basins and sills, reefs and sandbanks. South of Rügen Island the coast is distinctly structured, opening to the sheltered and shallow Greifswald Bay (in M-V inland waters). In contrast the coasts along Skane, Bornholm and the islands of Usedom and Wolin are quite even, with steep slopes along the Skane, Bornholm and Northern Rügen coast into the Arkona Basin, but shallow waters along the Southern coasts of Vorpommern and Zachodniopomorskie. These morphological features were widely formed during the last 15.000 yrs when the Baltic Sea went through several stages of transgression and regression.

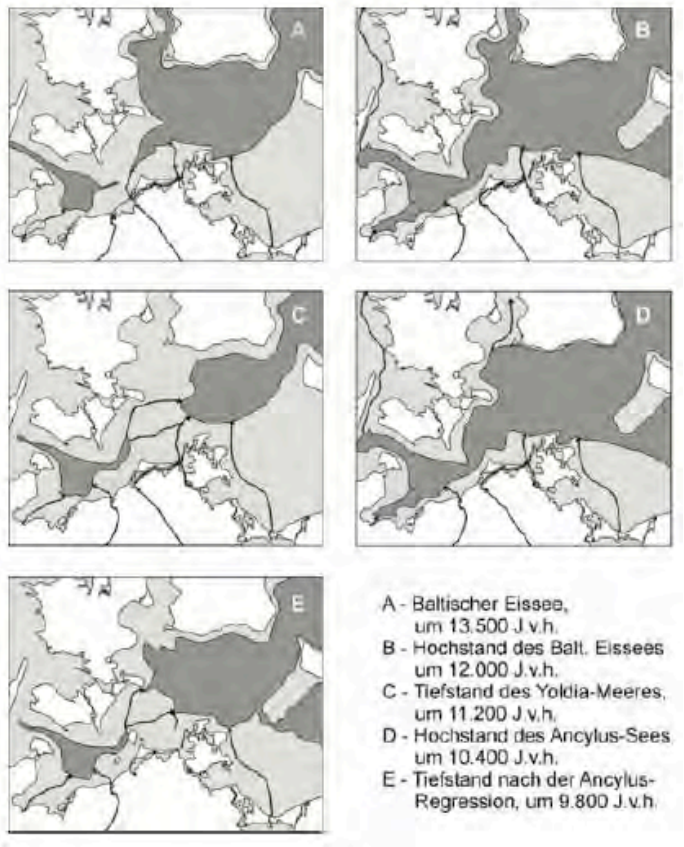


Fig. 4: Historical water tables of the Baltic sea (dark grey), the reconstructed drainage channels (black arrows) and the contemporary water table (post-Littorina). Source: IO Warnemünde: History of the Baltic Sea (website): "Paleographic development of the Western Odra region"

The Arkona Basin in the Northern part of the project area is a wide even basin up to 50 m deep, which makes it the deepest area of the pilot region. Unlike the Southern part of the pilot area and the Northern and Bornholm coastal areas, which were part of the mainland or islands during much longer phases in the early stages of the development of the Baltic Sea, Arkona Basin was part of the Yoldia Sea even at its lowest level (ca. 11.200 yrs ago) and follows its coastal outline. It features an almost ubiquitous mud surface.

In the Southern part of the pilot area, Adlergrund and Rønne Bank were formed by glaciers and have a very uneven surface, with depths between 5 and 25 m. Sediments are varied, with

[3] http://www.bsh.de/en/Marine_uses/Spatial_Planning_in_the_German_EEZ/index.jsp

glacial sediments ranging from sand and gravel and stones to big boulders several metres in size which are covered by mussel beds. Sandbanks and reefs are abundant in a fragmented way. At the Northern rim of Rønne Bank and along the Bornholm coast even some hard rock areas exist on the seabed.

The Oderbank stretches between Adlergrund and the Bornholm Basin South of Bornholm. Its most distinctive part is the shallow Oderbank as such – defined by the 10 m depth line - featuring layers of fine sands between 6 m and 10 m strong, which might have been formed by dunes.

The Tornquist fault runs through the pilot area from NW to SE, separating the Eastern European Plate from the Western European Plate. Very few earthquakes of relatively low intensity have been registered in the Northern and North Eastern part of the pilot area[4] over time – thus the South Western Baltic Sea is not considered an earthquake-prone zone.

Since large parts of the South Western region of the pilot area were land until 8.500/8.000 years ago, **submarine heritage sites representing early settlements may be present which will need to be considered**.

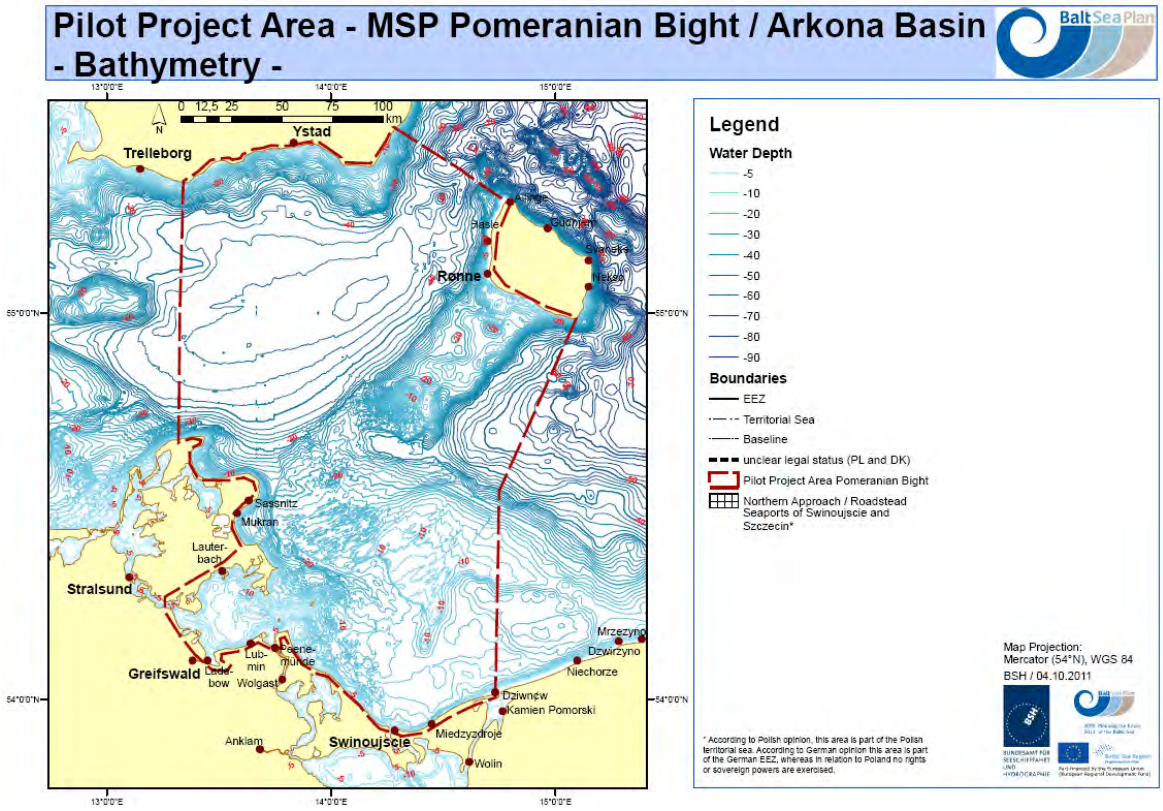


Fig. 5: Bathymetry in the pilot area (BSH 2011)

3.2.2 Water: Salinity and ice conditions

The project area is crucial for the Baltic Sea Region for saltwater inflow into the deeper sea basins into the central and eastern Baltic Sea. Saltwater is diluted by less salted surface water on its way from the Belt Sea through the Arkona Sea into the Bornholm Basin. Anoxia may easily occur in the deeper levels of Bornholm Basin when this diluted saltwater forms a layer at 60 to 80 m depth between the lighter water on top and the heavier water below. The higher up this layer settles in the water column, the greater the amount of water where anoxia may occur due to decomposing organic

[4] BSH, Umweltbericht 2009, p. 20f, cited data by University Helsinki, gathered from 1375 to date

material on the seabed. This material is produced by strong algal blooms and may be transported into deeper areas by currents. Anoxia can be very harmful to cod spawn as cod prefers to spawn at such depth. **Therefore wind farms and other fixed installations should not be erected in waters with salt water inflow, to ensure the eastward flow of saline water into the deeper sea basins is not impeded.** As the results of simulations conducted within the QuantAS project prove, this mostly applies to areas deeper than 25 m. Thus most of the Northern part of the project area, south of the Swedish coastal slope and north of Oderbank / Adlergrund / Rønne (light blue / green areas on the map below) could be relevant areas.

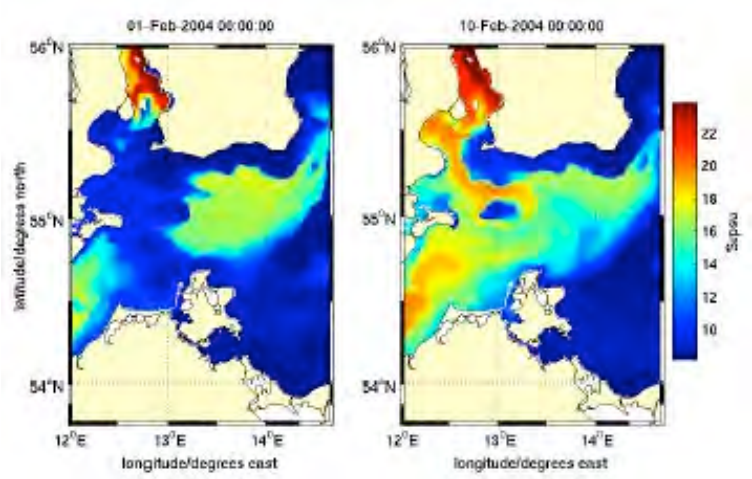


Fig. 6: Modeled bottom salinity distribution before and after an inflow event in early 2004. Source: Website QuantAS project, Arkona Sea Simulation[5]

In mild ice winters full ice coverage is only likely in the shallow inland water bays and lagoons since there is little exchange with warmer water. This may also include some coastal areas around Rügen and Usedom. Very strong ice winters may lead to full ice coverage West of Bornholm. The following map shows the frequency (percentage) of ice occurrence from 1961 to 2000 (BSH 2008). Compared to an earlier map (1990 – 1996, BSH 1996) this frequency seems to have decreased distinctly.

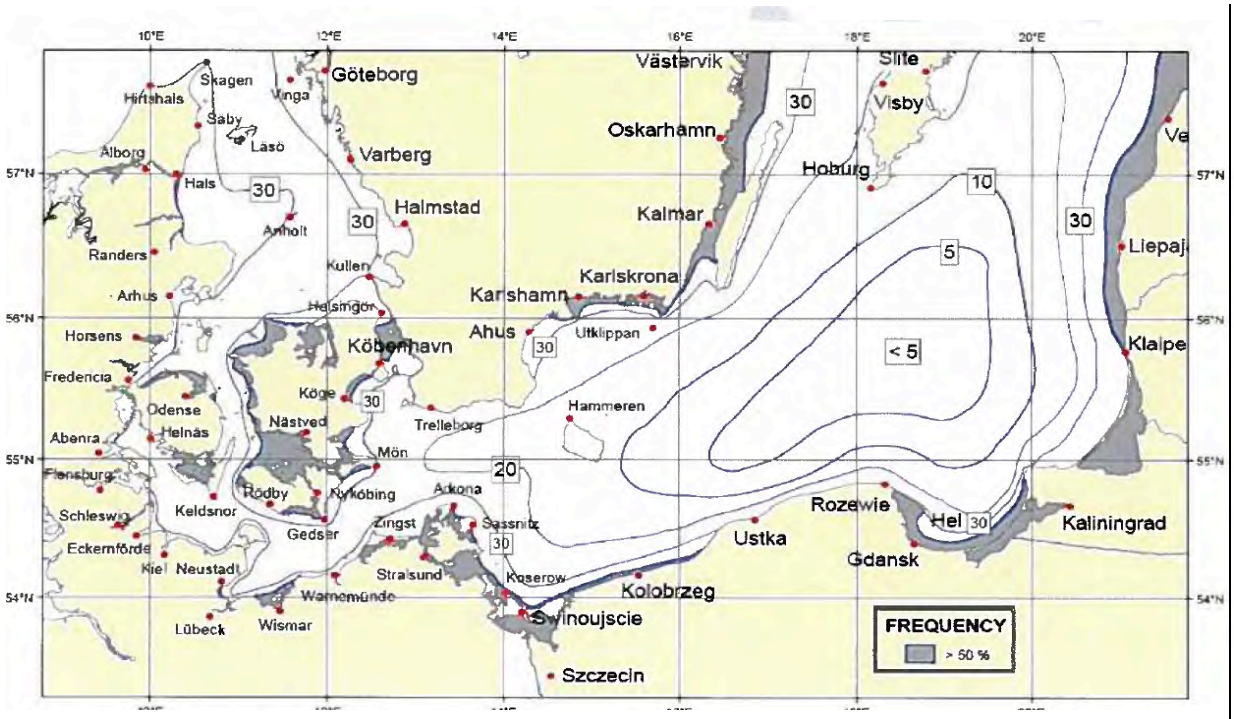


Fig. 7: Frequency (percentage) of ice occurrence from 1961 to 2000 (BSH 2008)

[5] http://www2008.io-warnemuende.de/quantas/index.php?option=com_content&task=view&id=30&Itemid=51

The following maps show the actual ice coverage during the winter of 2010/2011:

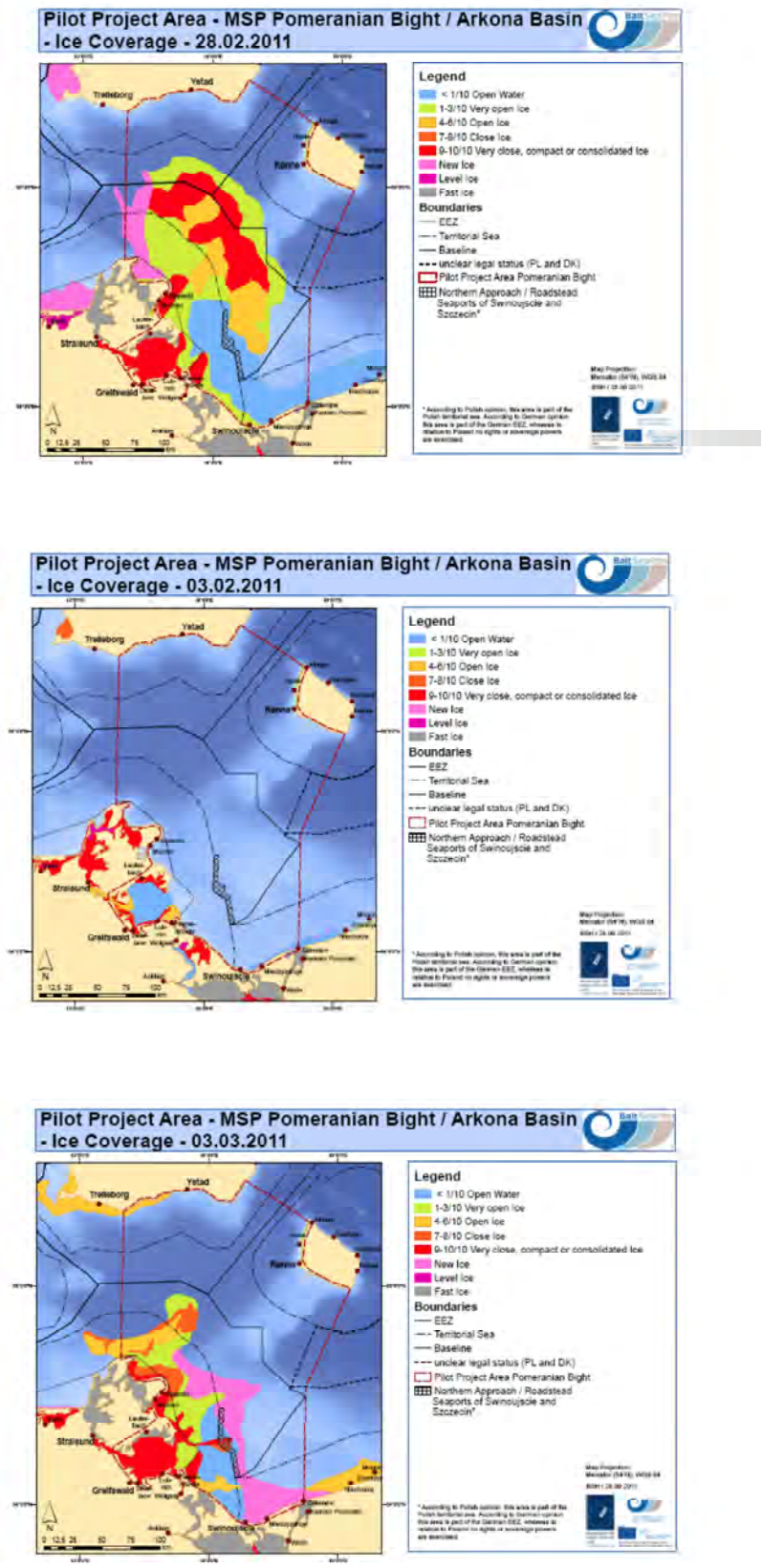
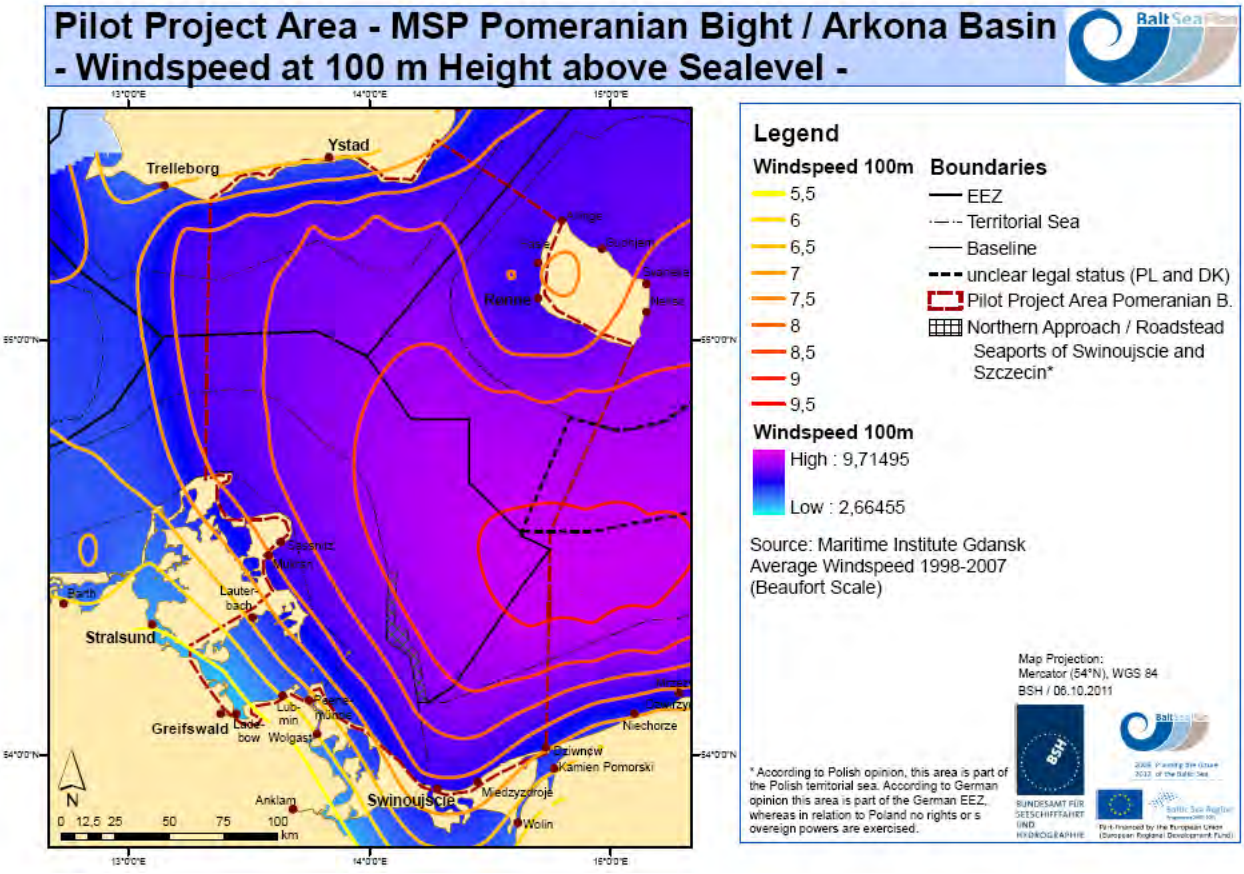


Fig. 8: Ice coverage during the winter of 2010/2011

Ice cover also leads to potential displacement effects of seabirds, which needs to be borne in mind in the context of other uses (which may also act to displace seabirds, creating cumulative effects).

3.2.3 Wind Conditions

Average wind speed at 100 m height for the pilot region (data from 1998 to 2007) is greatest in the central and eastern part of the pilot area, with the Adlergrund and Oderbank areas, as well as the outskirts of Bornholm Basin reaching average speeds of 9 Bft and above. **These areas seem well**



suited for wind energy production from the perspective of general wind conditions.

Fig. 9: Wind speed in the pilot area at 100 m above sea level (Data layer: Maritime Institut Gdansk, Department of Operational Oceanography, using data by ICM (Interdisciplinary Centre for Mathematical and Computational Modelling), University of Warsaw (1998-2007))

3.2.4 Important habitats

Habitats were taken into account by compiling information on valuable habitats, the most important species, protected species and Natura 2000 areas in the project area. Information was also gathered on reefs and sandbanks, together with further data on the abundance of sea birds and mammals and important areas for fish reproduction etc. More detailed and comprehensive information is available from the SEA conducted for the MSP for the German EEZ (BSH, 2009).

New seabed mapping and modelling tools were developed in another BaltSeaPlan pilot project and their applicability tested for MSP in general. This work included investigation of potential effects of ship noise on harbour porpoises, potential effects of ship traffic on dispersal of marine organism (blue corridors and connectivity) and new use of high resolution bathymetry data for seabed and habitat mapping with special emphasis on valuable reef habitats in connection with safe shipping routes (see Dahl et al. 2011).

3.2.5 Sea Birds / Migrating Birds

With the Adlergrund and Oderbank areas, the Pomeranian Bight is one of the ten most important habitats for resident, resting, moulting and migratory sea birds in the Baltic Sea. Ideal conditions (e.g. the rich food supply of the Adlergrund mussel beds)[6,7] are found in open, shallow waters with depths of up to 20 m. In times of ice coverage in the Eastern Baltic Sea these areas become even more important as resting birds then move to the Western Baltic Sea. No main resting, wintering or feeding areas are found in the areas of the Arkona Basin, where water depths reach 25 m and beyond.

The most abundant sea ducks (common eider, long-tailed duck, common scoter and velvet scoter) clearly prefer areas near the coast with marginal water depths as well as shallow grounds in the offshore area such as the Adlergrund and the Oderbank. Long-tailed duck are primarily present during winter and spring and feed on mussels available in shallow waters with no more than 15 m depth; concentration areas are on the mussel banks of Adlergrund and Rønnebank, but also on the Oderbank where the substrate is mostly sandy. Velvet scoter winter in the northern Pomeranian

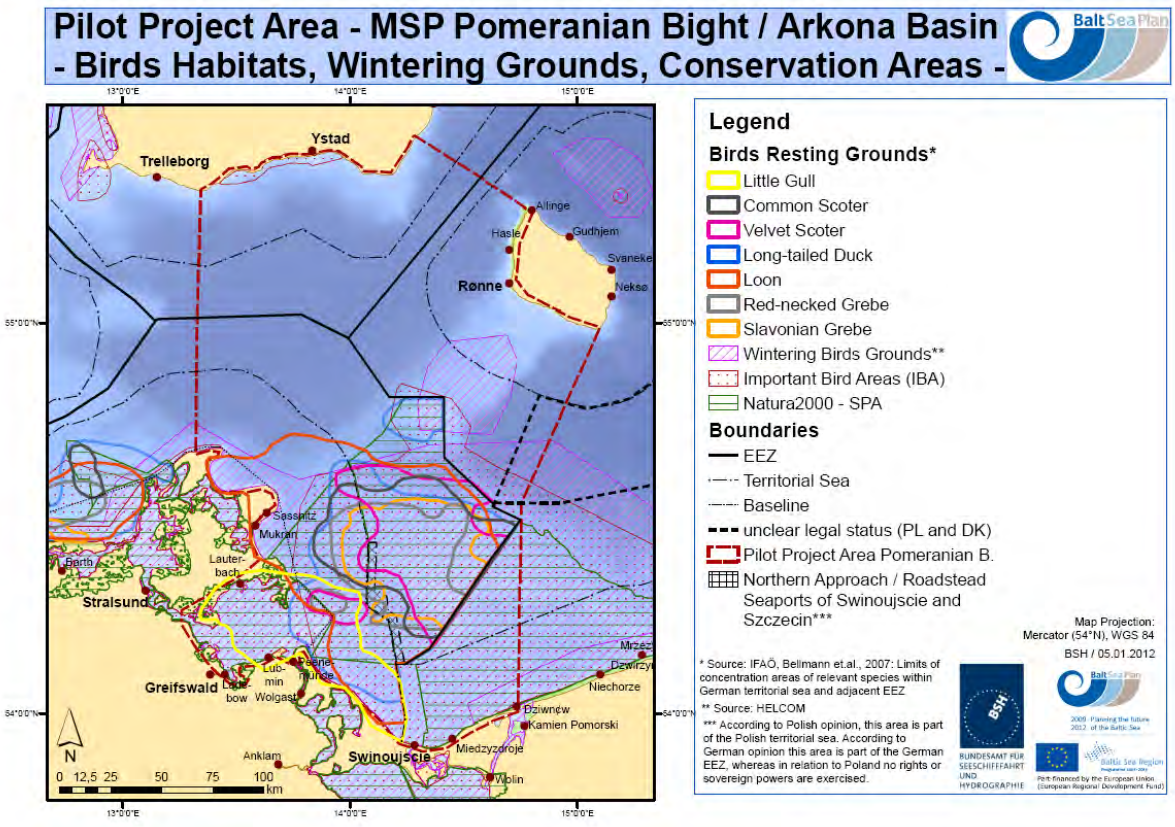


Fig. 10: Bird habitats and conservation areas in the pilot

[6] BSH, 2009

[7] see also BfN / vTI (Arbeitsgruppe Nord- und Ostsee): Maßnahmenvorschläge für das Fischereimanagement in Natura 2000-Gebieten der deutschen AWZ der Nord- und Ostsee, Hamburg/Rostock/Insel Vilm 20.04.2011

Bight between Oderbank and Adlergrund. Common scoter also winter in the area, preferring shallow areas of less than 20 m depth. The Oder bank is one of the most important resting areas for common scoter in the Baltic. Other duck species such as eider duck are present in the project area, but of less significance. Red-necked grebe is also present in the Pomeranian Bight during the winter months. Further information is available from the SEA for the MSP for German EEZ (BSH 2009) p. 158 ff.

Up to a billion birds migrate annually across the Baltic Sea. The western Baltic Sea is flown over by several species particularly worthy of protection (e.g. barnacle goose, whooper swan, common eider, common scoter and velvet scoter) in partially high intensities; it is also of above-average importance for the migration of land birds on account of the very high numerical abundances and a high percentage of endangered species migrating. Although there are gaps in knowledge with respect to the distribution of bird migration, known migration routes do cross the project area. These are:

- an East-West route crossing the southern part of the project area, which is mainly used by sea ducks and geese (blue line in the map below),
- an important crane migration route from Rügen to Skane (via the Arkona Basin, used by about 50-60,000 birds), and a minor route via Bornholm to Rügen,
- minor routes for diurnal birds of prey (green arrows),
- and broad North-South routes for diurnal and nocturnal terrestrial birds (black arrows also include waders; yellow arrows).

Ornithologists have found that more than 30% of all birds fly under 200m height, those not caught by the radar not included. This has implications for the planning of tall structures such as offshore wind farms.

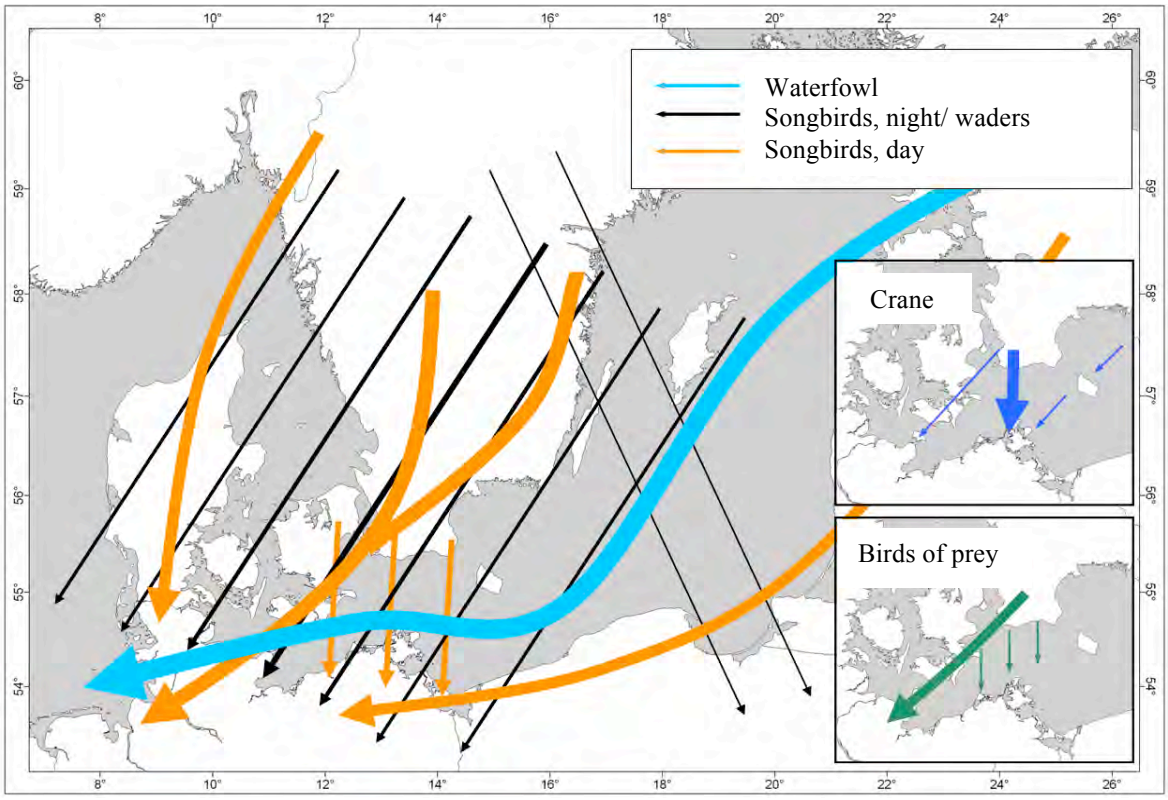


Fig. 11: Bird migration corridors relevant for the pilot area. Source: Bellebaum et al. 2008

3.2.6 Fish

The regional classification of fish communities is contingent on various environmental parameters, such as the availability of food and hydrographical parameters, in particular water temperature and salinity. In the Baltic Sea, the distribution of fish species is contingent on the salt content; as a result, the number and abundance of species declines from the west towards the eastern and northern parts of the Baltic.

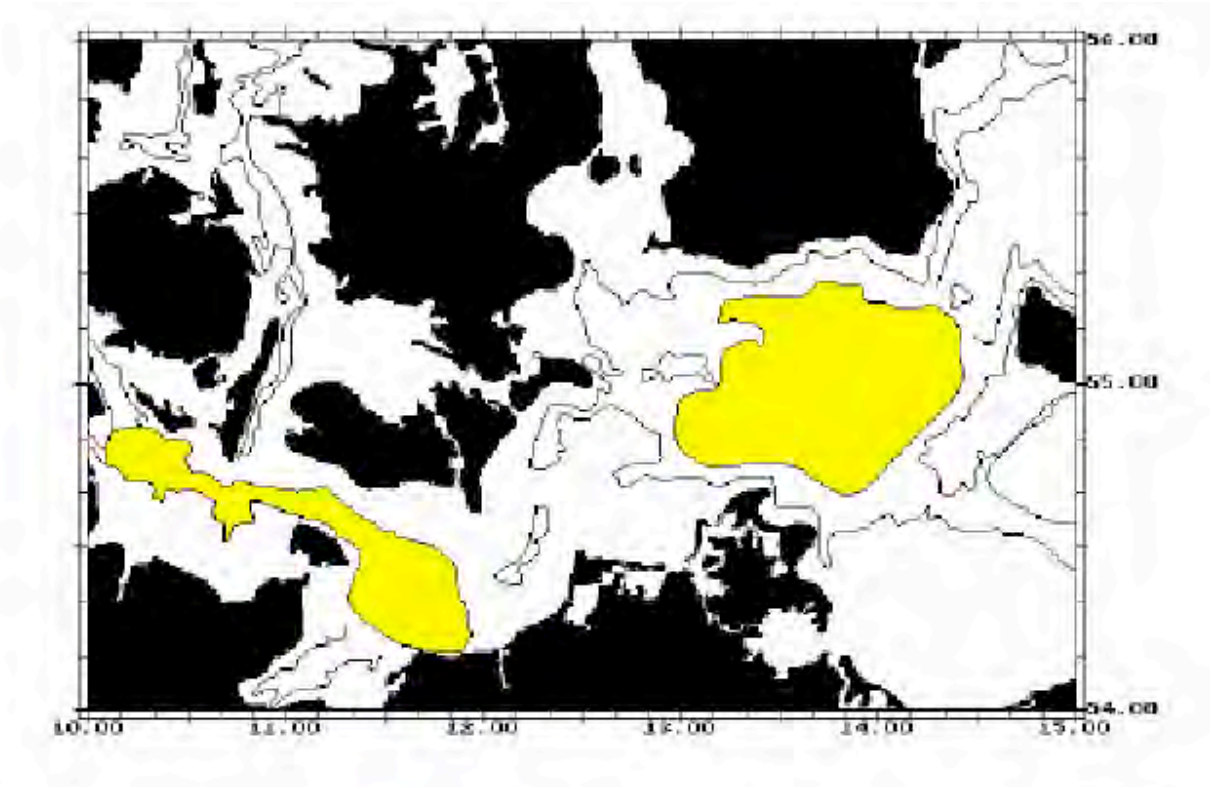


Fig. 12: Spawning areas for cod in the western Baltic Sea and Arkona basin (Source: Bleil & Oeberst 2000)

The current state of knowledge concerning the fish stocks in the EEZ is marginal. Excluding migrating species, about 30% of the species constantly found in the Baltic Sea are endangered.

The status of the fish community in the western EEZ has been assessed as marginal to average with regard to the criterion 'regional or national importance'. This is due to the fact that on the one hand, the fish species and communities described in the southern Baltic Sea are also found in other locations. On the other hand, the pilot area has some diversely-structured areas with stony grounds (Arkona Basin, western Fehmarn), which offer a habitat for a variety of fish species.

However, there is some information available about cod stocks in the pilot area (see Fig. 12). For herring the Greifswalder Bodden plays a major role.

3.2.7 Harbour porpoise

The high mobility in dependence of the special conditions of the marine environment leads to high spatial and temporal variability in the occurrence of marine mammals. Based on the vast number of study programmes which have been conducted in the past years, the data situation with regard to marine mammals has substantially improved, encompassing MINOS, MINOS+, research programmes of the Deutsches Meeresmuseum and surveys for monitoring the Natura 2000 areas, as well as Environmental Impact Assessment and studies done in the context of offshore wind farm

development. Nevertheless, there is no continuous monitoring programme for marine mammals in the EEZ and in coastal waters.

The harbour porpoise population in the Baltic Sea has strongly declined in the past decades, mainly as a result of bycatch, decimation of fish stocks and food limitation. As an extension of the ASCOBANS agreement (Agreement on Conservation of Small Cetaceans of the Baltic and North Seas), member states have signed the "Recovery plan for porpoises in the Baltic Sea (Jastarnia plan)", which aims to re-establish the porpoise population in the Baltic at min. 80% of its carrying capacity. Although the recommendations of the plan are focused on measures to reduce incidental bycatch in fishery, it will also be important to minimize any other factors causing disturbance (such as noise from shipping, offshore wind farms; see also BaltSeaPlan report No. 21, Mortensen et al. 2011)

Distribution patterns are unpredictable in space and in time. Based on abundance and distribution patterns, the use or importance of various sub-territories can be estimated as follows:

- Sub-territory Rügen: medium importance; partially high importance in the Oderbank area

- Sub-areas "Kriegers Flak" and "Westlich Adlergrund": Even though abundance is not very high in the pilot area, the importance of this sub-territory might be much higher, as it supports part of a population that only counts up to 400 individuals for the Baltic Proper.

3.2.8 Implications for MSP

Based on the assessment of the natural environment, some preliminary opportunities and constraints can be identified for the pilot area. A simple example is the overlay of information on bathymetry and wind speed, which can help to identify areas potentially suitable for offshore wind farming (see chapter 6.2). Other information helps to identify the specific constraints imposed by the natural environment, which is important knowledge not only for the pilot area, but for maintaining a healthy ecosystem throughout the Baltic Sea. A good example is the physical processes that maintain salinity in the Baltic Sea: Due to the importance of saltwater influx into the Baltic, it is crucial that this influx is not be impeded.

Ice cover is another example, representing a constraint for offshore wind farming but also an additional constraint in the context of seabirds. Ice causes the displacement of seabirds in the winter, which is particularly important when taking into account other sea uses which may also displace seabirds. This type of information allows for a tentative estimate of potentially cumulative effects of natural factors and uses on seabirds.

Last not least, information on important habitats, together with information on bird migration corridors, spawning grounds and marine mammals is important from a holistic Baltic point of view, helping planners in the pilot area to assess the relative importance of local populations or specific habitats in the wider transnational context. It is also important information for establishing blue corridors for migratory species, which are set out in the Vision 2030 for the Baltic Sea as a key element of transnational MSP.

3.3 Socio-economic environment (including structural information), trends and developments

3.3.1 Administrative context

The German coastal "share" of the pilot project area is part of the federal state of Mecklenburg-Vorpommern and part of the planning region "Vorpommern", which comprises the counties Vorpommern-Rügen and Vorpommern-Greifswald [8]. The Polish coastal share of the pilot project area is situated within Zachodniopomorskie Voivodeship, which is the fifth largest region in Poland and comprises 22,892 km^2. The Swedish share is made up of the local municipalities of Trelleborg, Skurup and Ystad, which are also in charge of spatial planning for the region. The Danish share comprises the Danish waters southwest of the island of Bornholm, which administratively is part of the Danish Capital Region.

3.3.2 Demography

Mecklenburg-Vorpommern in general and especially Vorpommern have suffered from distinct loss of population since German reunification. Population density has decreased from ca. 80 inhabitants/km^2 to 70/km^2, making the region one of the least densely populated regions in Germany[9] (average 2009: 229/km^2). The island of Rügen has 70 inh/km^2, whereas the three mainland areas – without Stralsund and Greifswald - are even less densely populated with 46 – 57 inh/km^2. Coastal regions have been hit less by out-migration than rural areas further inland, though some locations of shut-down coastal military bases have suffered as well (e.g. Peenemünde).

Population development in Vorpommern

	2010	1990 - 2009	Inh./sqkm
Stralsund	57.400	- 21 %	1487
Greifswald	54.200	- 19 %	1066
Nordvorpommern	105.000	- 12 %	50
Ostvorpommern	105.000	- 12 %	57
Rügen	67.600	- 20 %	71
Uecker-Randow	73.000	- 24 %	46
VORPOMMERN Region	462.200		70

Particularly young and well educated people have left Vorpommern, adding to the general trends of demographic change, with a very distinct decrease of the share of children up to 15 yrs and the increase of the share of elderly people from 65 yrs on. Demographic projections foresee an even further overall loss of population up to 2030 of 10.5 %. It seems that only the cities of Greifswald and (+ 9.7 %) and Stralsund (- 3.5 %) will be able to better cope with the situation, probably benefitting from their universities and economic environment.

[8] Until 2011 Rügen-Vorpommern, Nordvorpommern, Ostvorpommern , Uecker-Randow, City of Stralsund, City of Greifswald as separate administrative districts
[9] German Federal Statistical Office

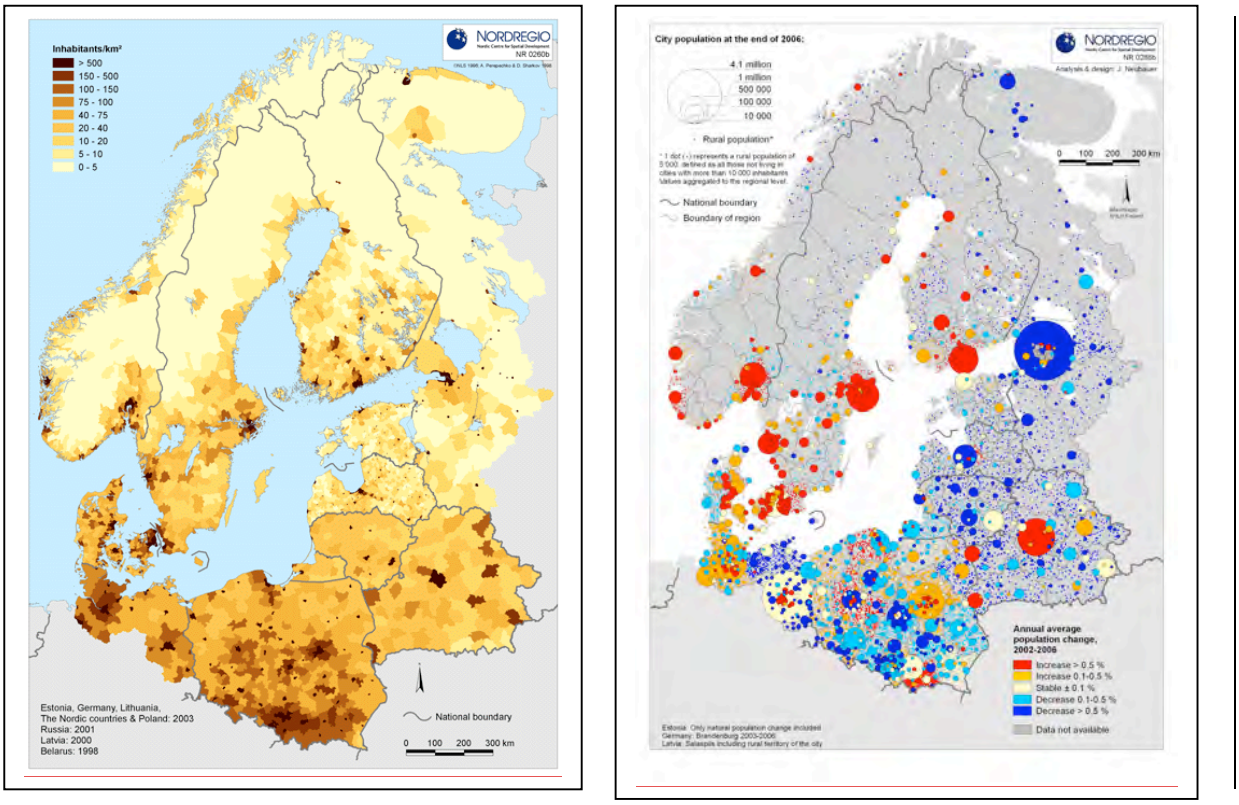


Fig. 13: Left: Inhabitants per km² around the Baltic; right: city population and population change 2002-2006 (Source: Nordregio).

Similar trends were identified for the Polish and Danish shares of the pilot region. Zachodniopomorskie Voivodeship covers 7.3 % of the whole country area and houses 4.5% of its population. Like in Mecklenburg-Vorpommern, population density is low, amounting to 74 inh/km² (the average in Poland is 124 inh/km²); also like in Mecklenburg-Vorpommern, the population in the Voivodeship is gradually decreasing. Urban inhabitants make up almost 70% of the population; the largest urban centres are Szczecin (407,800 inhabitants), Koszalin (107,400 inhabitants), Stargard Szczecinski (70,200 inhabitants), Kołobrzeg (44,900 inhabitants), Świnoujście (40,900 inhabitants), and Szczecinek (38,500 inhabitants). Bornholm has 72 inh/km².

Parts of the Swedish share of the pilot project area markedly contrast with the above. In the dynamic urban regions of Malmö and Lund, population growth is forecast to amount to 5% to 15% over the next decade. This is due to the dynamic Öresund region, which is still attracting in-migration also from abroad. Nevertheless, outside the urban centres, the Swedish coastal areas also have low population density of 15 to 45 inh/km².

3.3.3 Natural assets

Whilst the demographic and economic situation in the German and Polish share of the pilot area is generally challenging, both boast an abundance of valuable natural habitats both on land and sea, the preservation and sustainable management of which is being stressed. In Vorpommern, most of the coastal area and a large share of maritime space have been designated as Natura 2000 areas (Habitat and Bird Directive), National Park (Jasmund / Rügen), marine nature reserves, biosphere reserve (South-East Rügen) and nature parks e.g. on the island of Usedom and around Szczecin lagoon.

In the Polish share of the pilot region, Natura 2000 sites and other sites under national protection occupy 47% of the Voivodeship area, including areas that form part of the southern Baltic coast ecological system and the corridor of bird migration. There are two national parks within its borders: Wolinski and Drawienski (partially). Special attention is also drawn to the cultural heritage of Western Pomerania, featuring many historical objects, mainly from medieval times and characteristic features of regional architecture. Both the natural and cultural values of the area are regarded as the basis for the long- and short-term tourism development.

3.3.4 Economic situation

The economic situation of the German share of the pilot area is characterized by persistent structural weakness and ongoing structural change. Unemployment still is among the highest in Germany. Only Rügen and Greifswald show slightly better figures, possibly due to a greater labour demand from university and tourism enterprises.

For the German pilot project area the main features are:

a) Stralsund and Greifswald as a common **higher order central place,** university location, major industrial location

b) **Ports and ports industry**: industrial and ferry ports, the most important being Sassnitz-Mukran and Sassnitz City port, Stralsund, Greifswald-Ladebow (the only port to handle dangerous goods), Wolgast and Putbus-Lauterbach. Minor sea ports include Stralsund, Wolgast, Greifswald, Vierow, Üeckermünde-Berndshof, Lubmin. The industrial port of Lubmin, which is the landing point of the NordStream pipeline, serves the companies in the industrial area of Lubmin. The largest fishing port is Sassnitz-Mukran with some fishing industry. Small fishing ports also have some significance for coastal tourism as they add to the coastal cultural landscape and attractiveness. The main long-range ferry routes are Sassnitz-Mukran to Rostock, Trelleborg and Rønne (also Klaipeda and St. Petersburg). One project within the EU's Motorways of the Sea (MOS) concept is the „Königslinie"[10] from Sassnitz to Trelleborg for which further investments are planned.

c) **Ship building**: in Stralsund and Wolgast (Volkswerft, 1300 employees), further small leisure boats and yachts building companies, even a museum sailing boat wharf in Greifswald

d) **Tourism** is one of the most important economic sectors in Mecklenburg-Vorpommern, in particular in Vorpommern[11], with the coastal area the most attractive and the coastal islands tourist hotspots. Maritime tourism is a driver for further development such as new marinas and expansion of cruising, which may find themselves in conflict with nature protection issues, e.g. in the EU bird sanctuary Greifswalder Bodden. Ports are also important with regard to tourism as starting points and destinations for leisure and excursion boats. Leisure boat sailing mainly takes place within coastal waters and is being serviced by a dense harbour network.

e) **Agriculture** plays an important role in the area as the size of farms is such that they can compete on the EU market.

[10] „High - Quality Rail and Intermodal Nordic Corridor"
[11] with ca. 11,1 % GDP, share of people in paid work 15,1 %, share of overall turnover 12,5 %, , ca. 120,000 jobs, in VP – ca. 55 % of beds and overnight stays in M-V. (State Statistical Office M-V)

f) **Fisheries** play a traditional role in the economy. Although fishery still contributes to the regional economy in M-V, e.g. the fish processing in Sassnitz, it can be regarded as a minor economic sector. Culturally, high importance is assigned to fishery, and fishing ports are attractive places for tourists to visit.

The Polish part of the pilot area is characterized by tourism and a large port (Świnoujście, also serving as upstream port to the port of Szczecin) with all kind of goods (i.a. intermodal traffic). Szczecin and Świnoujście are major transportation nodes, primarily serving the transit lines across the Baltic Sea to Scandinavia and further on to Germany and the south of Poland, or even down to the Adriatic Sea. Ferry lines are an important part of sea transport, and the sea ports are potential nodes for the motorways of the sea, linking up to the Berlin metropolitan area as their hinterland for example. Industry generally is focused on the maritime economy and mainly concentrated in the mouth of Odra river. The port of Police and other small ports are also situated in the mouth of Odra River. There are further ports in Kołobrzeg and Darłowo and small fishing harbours on the Baltic coast.

Szczecin is the main potential metropolitan area, with Koszalin acting as the centre balancing the development of north-western Poland. The service sector dominates in the cities of Szczecin and Koszalin and in the coastal belt, with the sea coast and lakes particularly attractive for tourism. The service sector share in the gross added value (2006) was 71%.

Tourism along the Polish coast of the pilot area is mainly seasonal, with many jobs connected to the provision of accommodation in the coastal zone. The region of northwest Zachodniopomorskie is a very important tourism area with high numbers of overnight stays. This applies mainly to the area around Świnoujście, but also neighbouring towns and the area around Szczecin Lagoon (e.g. Międzyzdroje, Kamień Pomorski). Major assets and attractions are the valuable natural environment, the sea coast and lakes. High priority lies on water tourism (water sports, beaches). 85 % of overnight stays are at the coast,

The Swedish coastal share of the pilot area is also characterized by tourism and combined ferry/cargo ports. The Scanian plains are an important agricultural area.

Southern Skane is a thriving region, benefitting from its being part of the Öresund-Regionen – the urban centre and agglomeration drawing the majority of jobs in the Western part of the country. The region aims at further integration not only within the Öresund-Regionen but also with the "continental" counterpart on the southern Baltic coast. Thus major issues are the development of ports of Trelleborg and Ystad, and the strengthening of maritime traffic links in the region, e.g. to Sassnitz and Świnoujście.

Coastal **tourism** mainly takes place during the summer. It is characterized by a high number of summer homes, and mostly regional and national visitors. But tourists also come from Germany, Denmark and Britain and the strategy aims at increasing the number of visitors, thus also increasing the number of related jobs etc. It sees a high growth potential for sustainable tourism[12].

[12] Produkt- och destinationsutveckling - strategiska initiativ för utveckling av besöksnäringen i Skane (2010)

The island of Bornholm essentially relies on tourism and fishery as its main source of income. Tourism mostly takes place during summer season; thus many jobs are seasonal. In the fishing industry rationalisation, catch quota reductions etc have also caused job losses, which fish processing plants are trying to compensate by buying in additional fish from other countries. Farming has also seen intense rationalisation, with a shrinking number of farms. There still is a high unemployment rate and ongoing migration to other parts of the country.

The main economic potentials and prospects for the pilot project area were identified as follows:

a) **Tourism** is one of the most important economic sectors of the German and Polish coastal regions. The most attractive destinations are on the coast, contributing strongly to the dominance of the service sector. According to regional planning tourism should be further boosted and the coast developed as an all-year destination.

b) In Germany and Poland, further innovation and development are expected in the fields of **maritime industry** (ship building, shipping and port industry), and **energy production.** In Vorpommern, the industrial area of "Lubminer Heide" and former site of a nuclear plant is set to be developed into an industrial and international electricity transition grid node for offshore wind energy.

c) In all countries, seaborne **transport** is expected to play a major role in the development of port locations.

d) **Universities** and research institutions – some of them with a distinct maritime focus – are to be developed and act as drivers for development.

3.4 International legislation affecting maritime space

There is a wealth of international legislation with relevance for preparing a draft maritime spatial plan, which is summarized in **Appendix 1**.

3.5 The administrative framework for MSP in the countries

Different starting points in the different countries and different planning cultures

From the outset, it was clear that the transnational MSP process would start from different background situations in the four countries. Germany for example already has maritime spatial plans for the territorial waters of Mecklenburg-Vorpommern and the EEZ, whilst none have yet been drawn up in Denmark or Sweden. It was also clear that a transnational plan would need to be embedded in four different planning systems which differ with respect to the administrative responsibilities for coastal waters, territorial waters and the EEZ. Germany for example has a complex situation in that one state and the federal level are responsible for different shares of the pilot project area. In Poland, responsibilities are shared between the national and regional level, whilst in Denmark, the sovereign state regulates and manages the sea in the public interest. Denmark has the added difficulty that there is no dedicated authority responsible for MSP, which limits the availability of spatial planning documents and strategies for marine space. During the course of the project Sweden was in the process of founding a new national authority responsible for MSP (Havs och Vatten myndigheten / Swedish Agency for Marine and Water Management), which severely limited Swedish input to this project. Most importantly perhaps, different countries, as well as different bodies within the countries, have different planning cultures and approaches to MSP. Identifying these differences and overcoming them in the common planning process is one of the key challenges

of transnational MSP. Below is a short summary of available information for each country and an overview of existing national and sub-national legislation for marine space.

An overview table of national MSP legislation and other provisions affecting the Pomeranian Bight/Arkona Basin pilot area is provided in **Appendix 2.**

3.6 Relevant national strategies and trends in key sectors

The following is a summary of relevant national strategies, priorities and (where available) targets based on an assessment by the partners. It must be borne in mind that figures refer to the entire sea area of each country rather than the pilot area covered in this report. In the case of offshore wind for example, it is unclear what proportion of the total MW planned at a national level would apply to the project area. Nevertheless, national targets give a useful estimate of general trends to be expected. Partners also assessed the dynamism of the use in question, potential conflicts with other uses, and potential synergies. A full description of national targets and trends and a comparison of all BaltSeaPlan countries can be found in **BaltSeaPlan report 8** (Gee et al. 2012).

3.6.1 Offshore wind farming

> ***Note:*** *individual countries operate to different time horizons, rendering direct comparison difficult. Also, different conversion rates are employed to calculate the area needed to achieve a certain output in MW, which is related to different expectations of turbine size classes. In the national surveys, estimates of MW/km² range between 4 and 7.6. Here we use 4.54 (DK) as a reasonable average to calculate area needs and the percentage of national marine space. Growth in this sector in terms of MW generated does not necessarily translate into larger area requirements on account of technology development.*

Tab. 3: *National targets and trends for offshore wind farming*

	DK	DE	PL	SE	comments
Total MW projected (sum of existing/planned/ applied for)	2872	3435 (max. applied for territorial sea/ EEZ)	10.000 max. potential* 8000 more likely. 1500 MW expected to be installed by 2020	2500 (= 10 TWh?)	*assuming full use of potentially suitable areas, with 4MW/km^2
Time horizon	2025	2030	2030	2020	
Area required (km^2) (area = MW/4.54)	632	757 (max. applied for)	330 for 2020 target. 2500 defined as suitable area	550 (500 condit. interest area)	calculated figures except for figures in brackets
% of national marine space	1.39	4.9	5.95	0.33	calculated figures based on HELCOM total space

trend	growth: 7.6-fold increase expected in coming 15 years.	growth	growth	little growth. Wave power a poss. alt.	as estimated by partners
Are more parks likely and more area required than available/ searched at present?	no	no	possibly	possibly	as estimated by partners
major national driver	EU policy/ subsidies	National Energy Policy and investor demand	EU policy/ subsidies		as estimated by partners

3.6.2 Ports and shipping

Tab. 4: National trends and targets in port development and shipping

	DK	DE	PL	SE	comments
policy to shift goods from land to sea	yes	yes	yes		
investment in ports planned	+42% of current port area by 2025 over total of 23 ports	yes	yes	harbour strategy under development	
expected growth in shipping sector	average yearly growth expected (%): 0.9 (goods), 0.9 (tankers), 2 (ferries), 9.4 (cruise liners)	average annual increase of handling in ports of 4.6%, thus doubling of volumes by target year	2.4% annual increase in cargo handled reaching 115.6 m t.		Note the different end years.
time horizon	2020	2025	2033		
plans to build gas terminals	no	no	yes (Swinoujs-cie)		
policy to expand transport infrastructure		yes	yes (port access)		

Main national drivers		Intermodal North-South transport. Co-operation with North Sea ports through feeder lines	high political significance of major ports. Unexploited inland waterways connecting Black Sea, Baltic, Mediterra-nean	national maritime strategy and (climate-related) policy to shift transport from land to sea	as estimated by partners.

6.3.5 Natura 2000 and BSPAs

Note: *Information in this table is drawn from HELCOM report 124b (2010) for DK, PL, and SE. DE is taken from the national BaltSeaPlan report. Other marine protected areas may exist on top of the figures shown here (e.g. Sweden: marine national parks cover 2.5% of territorial waters)*

Tab. 5: National trends and targets in designating Natura 2000 areas and BSPAs

	DK	DE	PL	SE	comments
Total sea area (km^2) designated as Natura 2000	7949	7510	7204	6740	
% of total sea area of that country		49	30		SE: target for 2015
% of inshore waters (non-EEZ)		51		6	
% of EEZ		47	7	3.5	
plans to add more (km^2)				15% of marine area to form part of represent-ative network 10% protected	
plans to designate more Natura 2000 sites	no further designations planned	no further designations planned	no changes to existing boundaries planned	no further designations planned	
Protected marine area BSPA+Natura	27.8	49.6	54.6	8.3	from HELCOM 124b (2010)

2000 TW (%)					
Protected marine area BSPA+Natura 2000 EEZ (%)	8.4	54.7	8.6	3.9	from HELCOM 124b (2010)
BSPA = Natura 2000 (% overlap)	78.9	99.9	100		11% of total Baltic Sea area designated BSPA
Main national drivers	HELCOM BSPA, EU	HELCOM BSPA, EU	HELCOM BSPA, EU	HELCOM BSPA, EU	as estimated by partners

6.3.6 Sand and gravel extraction, oil and gas exploration

Tab. 6: National trends and targets in marine aggregate extraction and oil and gas exploration

	DK	DE	PL	SE	comments
National trends	25 active exploration licences in 100 active dredging areas (60 on annual basis). Trend stable.	Increase in sand and gravel demand (although demand in all variable). MV has designated priority and reservation areas, SH no licences at present. EEZ: some areas of exploration within Natura 2000 areas (although no extraction in EEZ since 2005 as no licences for exploitation). EEZ licences for exploration (not exploitation) valid up to 2040.	8 hydro-carbon exploration licence areas totalling 8054 km^2 in EEZ. Increasing demand for sand and gravel.	stable	

National drivers	industrial aggregate need (largest share), beach replenishment, land fill, construction fill, export	coastal defence will become more acute with climate change. Difficulty in sand and gravel extraction terrestrially. Infrastructure projects in the transport sector. MV requires 3 mio m^3 for short-term coastal protection measures (coastal erosion).	estimated 3 mio m^3 needed annually for coastal defence/ stablilisation in the face of climate change (up from 1,2)	coastal defence	also port construction, decrease in available gravel on land, climate change, flood protection; the energy business for oil and gas.

3.7 Existing spatial planning documents and (relevant) strategies in the countries

Partners brought together a wide range of documents with direct relevance to maritime spatial planning and/or the pilot area. Due to time constraints, the list is limited to what could be found easily. The following section gives a summary of the most important policy objectives. A full list of the documents scanned can be found in **Appendix 3**.

3.7.1 Denmark

In 2010 the Danish Government published "An Integrated Maritime Strategy", which gives an indication of topics that will be in the focus in years to come. Rather than proposing any major new measures, the strategy provides an overview of initiatives and measures that exist already or will be launched in the near future, in order to look for ways of coordinating and optimising the current efforts. There are five overarching objectives, which give an insight into future priorities. All objectives impact on MSP:

- To promote the excellent growth potential for the maritime industries, which are of key importance to the Danish economy (especially shipping, fishing and tourism); there is a corresponding focus on ports and transport infrastructure,
- To reduce greenhouse gas emissions and air pollution (e.g. from shipping),
- To protect the marine environment and the coastal zone, which includes the promise to ensure the implementation of the marine strategy framework directive as an environmental basis of the coming years' sustainable development of the maritime sectors,
- To achieve enhanced safety at sea,

> To better coordinate initiatives in the maritime field, which includes the promise to follow progress with MSP initiatives in the EU and put forward proposals for the future practice in terms of maritime spatial planning in Denmark.

At the municipal level, the relevant document is the Kommuneplan 2009 for Bornholm. Bornholm aims at becoming a 100% carbon-neutral island based on sustainable and renewable energy. Growth objectives include increasing the population, number of workplaces, and reduction of seasonal fluctuations.

Priority issues for the Danish part of the pilot area (Bornholm area):

> shipping and ports,
> tourism
> fishery

3.7.2 Sweden

Although Sweden has no specific legislation for its coastal areas except for shoreline protection, there are a number of relevant policy documents, for example, Sweden's National strategy for sustainable development and the Swedish Environmental Quality Objectives. There are also the municipal comprehensive plans. Key documents with relevance to MSP include:

> Planning and Building Act (1987): regulates spatial planning of land and water and building. The Act consists of regulations of how comprehensive plans should be established and accomplished, and how public interests should be considered when planning for land and water areas.
> The Environmental Code (1999): brings together the Swedish central environmental legislation. The Planning and Building Act and the Environmental Code form a basic framework for policy integration across sectors, for example, fishing, agriculture, forestry, and energy.
> The Swedish National Maritime Policy Bill (2009): introduces the concept of integrated MSP and the need for legislation and planning in the EEZ.
> At the local level, the relevant document is the Regionalt Utvecklingsprogram for Skåne 2009 – 2016.

Priority issues for the Swedish part of the pilot area:

> Development of the ports of Trelleborg and Ystad, together with the strengthening of maritime transport links in the region, e.g. to Sassnitz and Swinoujscie.
> Tourism

3.7.3 Poland

For Poland, a wide range of cross-sectoral strategies and programmes were identified at the national level including the National Concept of Spatial Development, the National Development Strategy, and the Operational Programme Infrastructure and Environment (see Appendix 3). Appendix 3 also contains a list of national sectoral strategies. At the regional level, three strategies are of particular relevance since they apply to the region directly adjacent to the pilot area.

Zachodnipomorskie Voivodeship Development Plan to 2020 (2010)

This plan bridges the regional state policy expressed in the National Regional Development Strategy and the National Development Strategy and the region's social and economic policies. A key priority is to ensure cohesive development of the Voivodeship with the border regions of Poland, Germany, Denmark and Sweden as well as with other Baltic countries. The proposals of the strategy are included in the spatial development plan of Zachodniopomorskie Voivodeship.

The priority that has a direct impact on MSP is the conservation and protection of natural environment values, which means proper management of protected areas, rehabilitation of the environment, rational use of natural resources, reduction of emissions (pollution, noise level) and use of renewable energy. The renewable energy section states that maritime areas in the EEZ can be used for wind energy purposes.

Another important issue mentioned in the Strategy is innovation and economic effectiveness. This includes, inter alia, development and promotion of regional tourism products/values (promotion of maritime recreation), development of the maritime economy and restructuring of fishery sector. The Strategy also aims to improve the spatial competitiveness of the region, inter alia by developing an effective, available and integrated transport system.

Strategy for developing the maritime sector in the Zachodnipomorskie region to 2015 (2010)

This strategy contains a number of aspects with impact on MSP in the Pomeranian Bight Pilot Project. One aim is to enhance the competitiveness of sea ports and sea transportation, which implies investment in port access, port infrastructure, and the port's potential to handle intermodal cargoes. The strategy sets out the following specific investments:

- development of the ferry terminal in port of Świnoujście and the construction of the external port with LNG Terminal;
- development of the industrial, logistic, distributional, and commercial functions of the ports,
- continued modernisation of the Świnoujście-Szczecin fairway to a depth of 12.5 m;
- deepening the water approach channels to Świnoujście and development of the outer port in order to allow entrance of ships with the maximum draft possible for the Baltic Sea (the draft value is determined by the depth in the Danish Straits)

With respect to maritime safety, the development of small ports and national energy security, the Strategy sets out the following specific actions:

- construction of infrastructure that enables diversified natural gas supplies (LNG terminal);
- modernization of the infrastructure used to handle solid fuels and liquefied fuels.
- exploration of oil, gas and mineral deposits beneath the seabed;
- development of offshore wind energy.

Sustainable use of natural resources, including sustainable development of the fisheries sector, are also promoted, including the protection of fishing resources and greater effectiveness and competitiveness of sea fishery at the same time. Sustainable use of natural resources of the Baltic Sea focuses on the following actions:

- implementation of projects related to the explorations and oil drilling, gas drilling and mineral deposits beneath the seabed;
- collection of the data concerning the actual users of the sea, conflicts and the value of the Baltic environment;
- assessment of size and of marine resources;
- protection of endangered species;
- monitoring of marine resource exploitation;
- restocking.

For coastal defence, the strategy sets out the following actions:

- improvement of the marine environment status and shoreline protection (monitoring of the marine and coastal environment);
- storm protection for shorelines and internal seawaters;
- creation of a sea protection regional plan in accordance with EU guidelines;
- reduction of the emissions produced by the maritime economy and the implementation of an all-embracing environmental monitoring programme;
- updated stocktaking of the natural values of the Baltic and its coastline;
- protection of landscape values;
- monitoring of Pomeranian Bight waters and marine waters based on physicochemical indicators, biodiversity and hydromorphological elements;
- prevention of shoreline erosion;
- measures to prevent and minimize losses during the construction and operation of LNG Terminal in Świnoujście.

The spatial development plan of Zachodnipomorskie Voivodeship (2010)

This plan sets out the strategic goals of spatial development for the region, with sustainable spatial development of the Voivodeship top of the list. The spatial development plan is in line with the other strategies presented above, summarizing some of the key priorities for spatial development. It was drafted taking into account a wide range of international programmes, such as VASAB 2010, South Baltic Angle, TransLogis, Adriatic-Baltic Land Bridge (A-B land bridge), South-North Axis (SoNorA), Baltic Gateway, Baltic Coast, BSSSC, and HELCOM. The spatial development plan also takes into account a broad range of national and regional strategic documents from all sectors, such as the National Development Strategy 2007-2015, the National Cohesion Strategy 2007-2015, the National Regional Development Strategy 2010-2020 (regions, urban centres, rural areas, the National Spatial Arrangement Policy of 2000, the programme of national roads construction for 2008-2012, the Odra Programme 2006, the Zachodniopomorskie Voivodeship Development Strategy until 2020, or the transport and tourism development strategies in Zachodniopomorskie voivodeship until 2015.

The most important sectors of Zachodniopomorskie Voivodeship economy are services, transportation, maritime economy, tourism, industry and agriculture. Regional strategies aim at developing the maritime sector, transport and tourism.

The ports of Szczecin and Świnoujście are the major transportation nodes, but there are some smaller ports along the coast, including small fishing harbours. The region is situated on the route of the Central European Transport Corridor (CETC) between Scandinavia and the Adriatic, and the spatial development plan foresees the CETC to be promoted and connections from Świnoujście developed as a MOS as its extension. Ferry lines make up for a large share of sea-borne transport; development of these is also planned, as is the development of short-haul ship traffic and the role of small sea ports. Further initiatives include ensuring safety standard in navigation, and extending / modernising port infrastructure, in particular developing the potential for handling intermodal transport units. Industry in general has its focus on maritime economy. In Świnoujście infrastructure for LNG transshipment and storing is being projected with a new outer harbour being planned and a terminal for boat excursions. Shipyards are to benefit from innovative recycling and will be boosted to expand their potential to construct small and medium sized vessels.

Tourism has a big and growing share in the economy, and the Zachodniopomorskie Development Plan marks the Szczecin lagoon area as suitable area for tourism. The region aims to invest more in health and wellness tourism, and ports for leisure sailing boats are to be extended and marinas modernised. Natural and cultural values are generally considered an important basis for long- and short-term tourism ("Woliński Park Narodowy"). Fishing villages will be developed for tourism, cruise ship infrastructure strengthened (a service station provided in Szczecin), the West Pomeranian Sailing route from port to port promoted and the recreation fleet rebuilt.

Fishery is to become sustainable and based on a scientific assessment of resources, with fishing monitored and natural spawning grounds protected. Fishing ports and their infrastructure as well as the fishing fleet are to be promoted and developed. Sport fishing is also promoted and withdrawn fishing boats may be reused.

Mineral resources are to be assessed with regard to locations and quantity. This includes the search for crude oil, gas and mineral deposits. Within the pilot area several areas holding "technical sand and gravel" and "heavy minerals" have been identified.

The spatial development plan promotes wind energy, although no areas have yet been assigned within the pilot area. The current information is that no offshore wind farms will be permitted within the territorial sea.

Regarding the natural sea environment in general, the spatial development plan sets out to improve the status of the natural environment and water quality and protect the seashore. Natura2000 protection plans will be developed. Coastal protection is an issue in some parts of the coast.

Priority issues for the Polish part of the pilot area:

- Development of the maritime economy, in particular development of ports and port infrastructure (transport generally, ferries, recreation, also LNG infrastructure)
- Enhancing energy independence (offshore wind, LNG)
- Coastal tourism (based on natural and cultural assets, wellness, recreation, boating/small ports)
- Coastal defence (shoreline protection)
- Sustainable fisheries

3.7.4 Germany

In the pilot area Germany has the only legally binding planning documents with explicit reference to Maritime Spatial Planning. They are the Landesraumentwicklungsprogramm Mecklenburg-Vorpommern (LEP) (Spatial Development Plan for the 12-sm zone Mecklenburg-Vorpommern), and the Raumordnungsplan für die deutsche ausschließliche Wirtschaftszone in der Ostsee (Maritime Spatial Plan for the German EEZ). The Regionales Raumentwicklungsprogramm Vorpommern (regional spatial development programme, August 2010) is also relevant at the level of the federal state.

Different approaches are taken to MSP in the territorial sea and the EEZ. This is the result of different MSP 'philosophies', but also of different constraints experienced when drawing up the respective maritime spatial plans. The differences manifest themselves in the respective zoning concepts that are applied. Mecklenburg-Vorpommern's Spatial Development Plan for the 12-sm zone recognises three area types:

- Priority areas, which are reserved for a defined use. Other uses conflicting with the priority use are excluded.
- Reservation areas, which are reserved for uses given special weight in the planning process. A case-by-case decision is made here: Other uses may be permitted if a comparative analysis shows their significance and the lack of acceptable alternatives.
- Suitable areas, which are the only areas where specific uses are permitted. The defined use for these areas is precluded elsewhere. Offshore wind farms for example can only be built within the two suitable areas for wind farm development and are not permitted elsewhere.

In contrast, the Spatial Development Plan for the EEZ only recognises two types of area:

- Priority areas (for shipping and offshore wind farming),
- Reservation areas (for shipping and research).

The German EEZ (pilot project area only):

The MSP for the EEZ includes:

- a network of **priority areas** for shipping (based on the existing and planned TSS and major shipping routes) with adjacent **reservation areas**,
- a **priority area** for offshore wind energy plus a "gate" at the territorial sea boundary through which energy cables from future wind farms to the coast must pass,
- **Reservation areas** for research.
- Within nature conservation areas (Natura 2000, shown in the plan for information only) no wind farms may be built. No fixed installations may be built in shipping routes. Safety zones have to be maintained around any offshore wind farms and shipping routes.

The LEP (Spatial Development Programme) M-V:

The applicability of the LEP has been extended into coastal waters (12sm-zone) to ensure conflict management between the demands of new technologies (offshore wind energy sites), tourism and nature conservation, and traditional sectors like shipping, fishing and coastal defence at an early stage.

The binding objectives, principles and other requirements of spatial planning represent the framework for further development of the sea area. This framework guides those involved in public

planning, but also those representing private interests when they are planning measures with spatial impacts.

The goal of the LEP is to implement the principles of sustainable spatial development, bringing together territorial social and economic requirements with the ecological functions of the area, leading to long-term, large-scale and balanced spatial development.

Tasks:

- The guidelines for spatial development which introduce the programme represent the main focal points for the region's future development.
- The LEP (Spatial Development Programme) M-V is strategic in character and outlines the priorities for Baltic Sea use in the coastal waters of Mecklenburg-Vorpommern. Of special importance regarding MSP is the 12th guideline, which aims to secure the use of the potentials of the coastal waters.

The LEP (Spatial Development Programme) M-V features the following areas:

- **priority areas for mineral resources** with regard to use for coastal protection, and reservation areas for commercial purposes
- **reservation area** / corridor pipelines with regard to the NordStream pipeline and electricity cables in the inland waters part of Greifswald Bay
- a **suitable area** for offshore wind energy (projects are subject to a spatial planning procedure)
- **reservation areas** for tourism, covering some coastal areas but also inland waters.
- The main shipping routes have been visualised in the map, but in general the whole territorial sea is seen as a federal waterway
- Nature conservation areas are either **priority areas** (for nature and countryside conservation reasons) or **reservation areas**. Priority areas comprise National Park areas and nature reserves. Reservation areas comprise areas to be designated under the Habitats Directive, coastal waters and near-natural coastal areas classed as showing "undisturbed development of nature" (see LEP p. 44 Fig. 12 and 13).

The Regional Spatial Development Programme Vorpommern (RREP)

Similar to the Polish Spatial Development Plan for Zachodnipomorskie Voivodeship, the regional spatial development programme sets out priority areas for spatial development. One of the major issues of the Regional Spatial Development Program Vorpommern (RREP) is to further develop **the maritime transport** infrastructure. Sassnitz-Mukran, along with Rostock, is the most important sea port in M-V for Baltic Sea cargo and ferry traffic. The document stresses further enhancement with regard to the trans-European transport network in the areas of multimodal cargo and passenger transport. Further investments are planned in the MOS line from Sassnitz to Trelleborg. Ferry lines serve everyday traffic but also attract tourists and are set to be further developed, e.g. to destinations outside the planning area (destinations e.g. Klaipeda, St. Petersburg).

The RREP assigns high value to tourism and defines focus areas and development areas for tourism mainly along the coast[13]. The document stresses the need to ensure accessibility and usability of sea

[13] Darss/Zingst, Hiddensee, Rügen North of Wieker / Jasmunder Bodden, Prorer Wiek, Sellin/Baabe/Göhren/Middelhagen, Usedom Pomeranian Bight coast, Middle part to Bansin

space. Tourism focuses on family/summer holidays, taking advantage of beaches, facilities for water sports / sailing, and scenery and cultural heritage (including the cities of Stralsund and Greifswald). Leisure boat traffic between coastal resorts has a long tradition and is to be extended, meaning the respective water areas will be kept open.

Attractive conditions for fishery are to be maintained and developed.

Other existing agreements relevant to the pilot area

ICZM is a voluntary tool to be used to mitigate conflicts between spatial claims. Thus there is a precept for coordination in the territorial sea (OWF, linear infrastructure, nature conservation, tourism, securing supply of raw materials for coastal protection and commercial uses, safety and efficiency of sea traffic, underwater cultural heritage, fishery, aquaculture, military/defence, dredging of waterways, dumping of dredged materials etc.).

Based on a development concept for Greifswald Bay with detailed regulations/restrictions (temporal, all-year) etc. of use, such as water sports, further spatial planning regulations were drawn up. Since 2005 a voluntary agreement has been in effect with water sports and anglers clubs with spatial and temporal regulations in Greifswald Bay and the sound leading to Stralsund[14].

Priority issues for the German part of the pilot area:

- Sustainable development of the maritime economy, in particular development of ports and transport infrastructure (ferries, recreation)
- Coastal tourism (based on natural and cultural assets, recreation, boating/small ports)
- Coastal defence
- Sustainable fisheries
- Protection of natural assets

3.7.5 Summary of the main socio-economic characteristics and development priorities of the coastal areas adjoining the pilot area

There are many similarities between the German, Polish and Danish shares of the pilot project area. All are characterised by relatively low population density, with a sharp population decrease specifically in the German share of the planning region but also observed in the Polish Western Pomeranian region and Bornholm. The main economic sectors are tourism, fishery and agriculture, interspersed with small impulses for growth predominantly in the port cities (e.g. Stettin). This growth is driven by the respective port economies, which include ship building, cargo handling, ferry traffic or the energy sector (LNG). Enhancing the regional and local economies is thus a key priority for all coastal areas, with tourism, marine transport and port development, and energy (LNG, some offshore wind) named as the main drivers of growth. The relative importance of these sectors to regional development perhaps varies slightly, with the Polish share of the pilot region relying more heavily on port infrastructure and LNG terminal development than the other regions. The Swedish part of the planning region is dynamic in contrast and – from a national viewpoint - densely populated, with agriculture and tourism representing important economic sectors.

[14] Landesanglerverband Mecklenburg-Vorpommern (LAV) et al. (2006) "Angeln und Naturschutz im Greifswalder Bodden und Strelasund"

The main character of the pilot region is twofold: On the one hand, it is a rural tourism region, which relies on natural and cultural coastal assets for attracting tourists, plus an expanding recreational industry (leisure boating, cruising etc.) and investment in wellness tourism. Tourism infrastructure is well developed in all four countries. The pilot region also contains outstanding coastal nature conservation areas which can act as positive factors for coastal tourism. This is complemented by a marine area of high nature conservation value.

On the other hand, the pilot area (both its coastal and marine parts) is a busy and potentially expanding shipping region with important transport links not least in terms of North-South ferry connections as part of European transport networks. Ports are key drivers of local economic development and cornerstones of transport infrastructure, in particular at the transnational level. All four countries thus place considerable importance on developing transport and port infrastructure both for larger industrial and for smaller (recreational) ports.

Energy (offshore wind farming, oil and gas) appears to be a national priority. The situation with respect to marine aggregate extraction is generally stable, with no major developments on the horizon. Sand extraction is particularly relevant for coastal defence.

Summary of the main issues relevant to spatial planning:

- high importance for and high density of maritime traffic and transport (bulk goods, containers, ferry transport – both goods and passengers): Transport-Link North-South (ferry connections), East-West (transit-) traffic, important ports for freight on Southern Coast (Sassnitz and smaller German ports, Świnoujście / Szczecin), ferry ports in all states (Sassnitz, Świnoujście, Ystad, (Trelleborg – outside area), Rønne)
- high importance of the (maritime/coastal) tourism sector within the regional economy and of the region as a (coastal) tourism destination.
- High importance for nature conservation/ecosystem: among others: important wintering birds areas, largest spawning area of Baltic Herring

4. A stocktake of current and expected uses in the pilot area

4.1 Identifying the main planning issues

Building on the description of the pilot area, the next step was to assess trends and developments in key maritime sectors with a view to identifying current and potential conflicts of use specifically in the pilot area. This assessment stage built on the identification of general trends to be expected in the maritime sectors, the identification of potential conflicts, and an overview of current levels of use/the status quo of the main sea uses in the pilot area. Data gathering and data availability played a key role during this stage, as set out below.

4.1.1 General trends in key sectors

BaltSeaPlan report 8 identifies general trends in maritime sectors. These serve as a useful overview of which sectors can be expected to be particularly dynamic in the years to come. Although these trends were identified for the Baltic Sea as a whole, bringing together national trends from all BaltSeaPlan partner countries, they equally apply to the pilot area: (Tab. 7):

Tab. 7: Trends expected in key sectors in the pilot area up to 2030 (adapted from Gee et al. 2011)

Sector	Current dynamism	Development expected up to 2030
cable and pipeline construction	+	Plans for more electricity cables (wind farm connections)
coastal tourism	+	Coastal tourism and recreation (e.g. boating, fishing) will continue to grow. Strong increase in cruise tourism expected.
dredging for ports	++	More dredging to be expected to cater for larger ships at ports
fishing	+	Pressure on fisheries to continue; growing importance of protected areas, nurseries, and sustainable fisheries management
landscape protection (coastal and marine)	+	Coastal landscape important for tourism.
mariculture	0	not yet an issue
Marine Protected Areas	+	continued importance; management plans expected
military activity	0	no information available
offshore wind farming	+	potential increase in the total sea area dedicated to offshore wind farming in the pilot area.
oil and gas exploration	0	not an issue
ports (incl. LNG terminals)	++	Investment in port infrastructure planned. Connections to hinterland essential.
recreational boating	++	increase likely in parallel with expansion of tourism
sand and gravel extraction	0	expected to remain stable
seafloor habitats (reefs)	++	Added protected zones likely to be established as more data becomes available
shipping (goods, passengers)	++	continuous increase in the number of ships, shipping frequency and volumes transported
shipping (oil)	++	continuous growth in oil transportation through pilot area
transport infrastructure on land	+	investments in rail and road infrastructure expected, but will take time. Focus on main transport axes and access to ports.

4.1.2 Data scope and availability

From a socio-economic perspective, the following were identified as key issues for the pilot area:

- high importance of maritime transport,
- high importance of coastal tourism,
- high importance of nature conservation and fishery, and the potential for conflict with other sea uses (e.g. wind energy, cables and pipelines).

This led to the conclusion that information and data were specifically required on the following:

- Shipping /maritime transport (transit and regional target traffic) and port development
- Nature conservation (Natura 2000)
- Tourism
- Fishery
- Sand and gravel and other raw materials,
- Cables and pipelines.

Where available, data was collected not only of current uses, but also of future trends and specific spatial objectives. Some of this information could be drawn together from the respective sectoral strategies, although it can be difficult to break down such (mostly national) information to the level of the pilot project area. Information on national sectoral targets such as offshore wind farming, sand and gravel extraction, shipping, Natura 2000 and fishing was available for the Baltic Sea generally, which was useful background information.

From the outset, it was clear that data availability was going to be uneven. Generally, there is plenty of data available, but not all was found to be spatially relevant. Most of the data used from HELCOM, Nordstream, or the Balance project are generalized and do not have the right scale for the pilot area, for example. Nevertheless, some of the data used were the best available and most easily accessible to the project. As a result of this unevenness, only some aspects could be taken into account in the stocktake, leading to varying detail in the sectoral information listed below. There was also uncertainty with respect to data reliability (how up-to-date is it?).

The general feedback from the partners on data issues was quite diverse, with gaps in general concerning fisheries, tourism, harbour development and also specific formats of data. Germany and Poland were able to draw together most of the required data for their national shares of the pilot project area, but even there some data was unobtainable. In Poland, a main obstacle was the compatibility of data formats with GIS standards; there were also financial and time limitations restricting the possibilities for transferring or adjusting the available data. Some data were only available for a fee. Data on tourism is generally not available in a spatially relevant format and varies in quality. There is also the question of how to integrate existing designations and regulations in the MSP. Generally, collecting data was a continuous process throughout the project, running in parallel rather than in any strict order.

Two issues emerged as particularly difficult to deal with, either due to the overall lack of data or due to the difficulty of integrating the available information into the MSP process. The first is drawing together spatial information on the marine environment, which is a prerequisite for identifying potentially problematic areas and finding MSP solutions. For some areas conclusions can be drawn from existing maps produced within the BALANCE project (Marine Landscapes, see also IFAÖ (2007) for German coastal waters). For the German MPAs, several data layers were available from the Federal Agency for Nature Conservation (BfN) which originally formed the basis for identifying Natura 2000 sites; these can be used as biodiversity layers for MSP. Existing background information can also

be gathered from the HELCOM Marxan analysis on MPA site selection. New methods for mapping the seabed have been tested by BaltSeaPlan (Dahl et al. 2011); other documents were also produced on this specific issue (Göke et al. 2012, the report on Polish Fisheries).

The second is fishery, where spatially relevant data can be difficult to obtain and even more difficult to integrate in a maritime spatial plan. This is the reason why Germany, for example, has not included fisheries into their existing MSPs. Due to these difficulties attempts were made to integrate modelling data into the MSP process. Late in the project, spatially relevant data did become available for fisheries (see chapter 6), which is why an attempt was made to include fisheries in the draft spatial plan (see chapter 7).

An unresolved question was how to deal with climate change, and whether the impacts of climate change (e.g. on fishing grounds or habitats) could be modelled in such a way that it could be included in a maritime spatial plan.

Assessing the sufficiency, quality and content of existing data is a key requirement in the stocktaking phase. It is very useful to have separate meetings on GIS and data exchange in a smaller dedicated 'data group'.

4.2 Sectoral overview of the main planning issues

4.2.1 Shipping and transport

Shipping is one of the most important uses in the pilot area. This applies to the highly frequented East-West transit routes (most of these already bundled by IMO regulations), as well as the North-South connections between the ports of Sassnitz and Swinouscje in the southern part of the pilot area and the Swedish ports of Trelleborg and Ystad. There are also ferry connections between Rønne/Bornholm and Sassnitz, as well as Ystad and Swinouscje.

Several large co-operation projects contain the expansion of these connections as part of large-scale transport links within and through the pilot area. North-South connections are supported by the EU initiative CETC (Central European Transport Corridor) which seeks to improve transport links between the Adriatic region and the southern Baltic and Scandinavia. The projects Scandria (Interreg IVB - Baltic) und SoNORA (South North Axis, InterregIVB – Central Europe) are other, competing European logistics and transport projects aimed at improving transport links between Scandinavia/the Baltic and the Mediterranean. Scandria includes the pilot area, SoNORA is adjacent to it. The projects EAST WEST Transport Corridor II (EWTC II) and TransBaltic Sassnitz and Trelleborg are linked by the so-called "Royal Line" as part of the European Commission's "Motorways of the Sea" concept.

There are plans to extend Sassnitz/Świnoujście to cope with increasing North-South traffic, with Rønne/Trelleborg also planning to expand. Transport to and from Russia is also expected to increase, as is liquefied gas transport. The transport of dangerous goods is expected to increase along the main East-West shipping routes.

Main shipping routes were identified by means of AIS data, in particular for shipping with a draught of more than 2.5 m. The main shipping routes show up clearly in the map, in some areas diffuse traffic is also present. The ferry routes within the pilot area are also clearly visible. Smaller freighters also approach the smaller ports in shallower waters (e.g. to Stralsund via Greifswalder Bodden). No comprehehsive information is available for fishing vessels or leisure boats, but the existing information does yield some general trends (e.g. leisure boating along the coastline and in shallow

waters outside the main shipping routes; fishing vessels strongly distributed depending on the season and target species, see maps in the Appendix).

The main linear feature in the pilot area is the IMO traffic separation zones which serve to bundle sea transport along the East-West transit routes. Trelleborg, Ystad, Sassnitz/Sassnitz-Mukran, Świnoujście and Rønne represent the significant ports in the pilot area; smaller ports along the German and Polish coast are also important for the regional economy (transport, tourism, fisheries).

Information available:

- Information from planning documents
- IMO regulations ("the big picture")
- HELCOM risk assessment
- Maps Maritime Traffic (Landmäteriet/SE, >2.5 m draught , IMO Cat. X (dangerous goods), <2,5 m draught, fishery, leisure sailing)
- AIS tracks
- Maps of the TEN-T network
- The German MSP – including the main shipping routes with respective regulations.

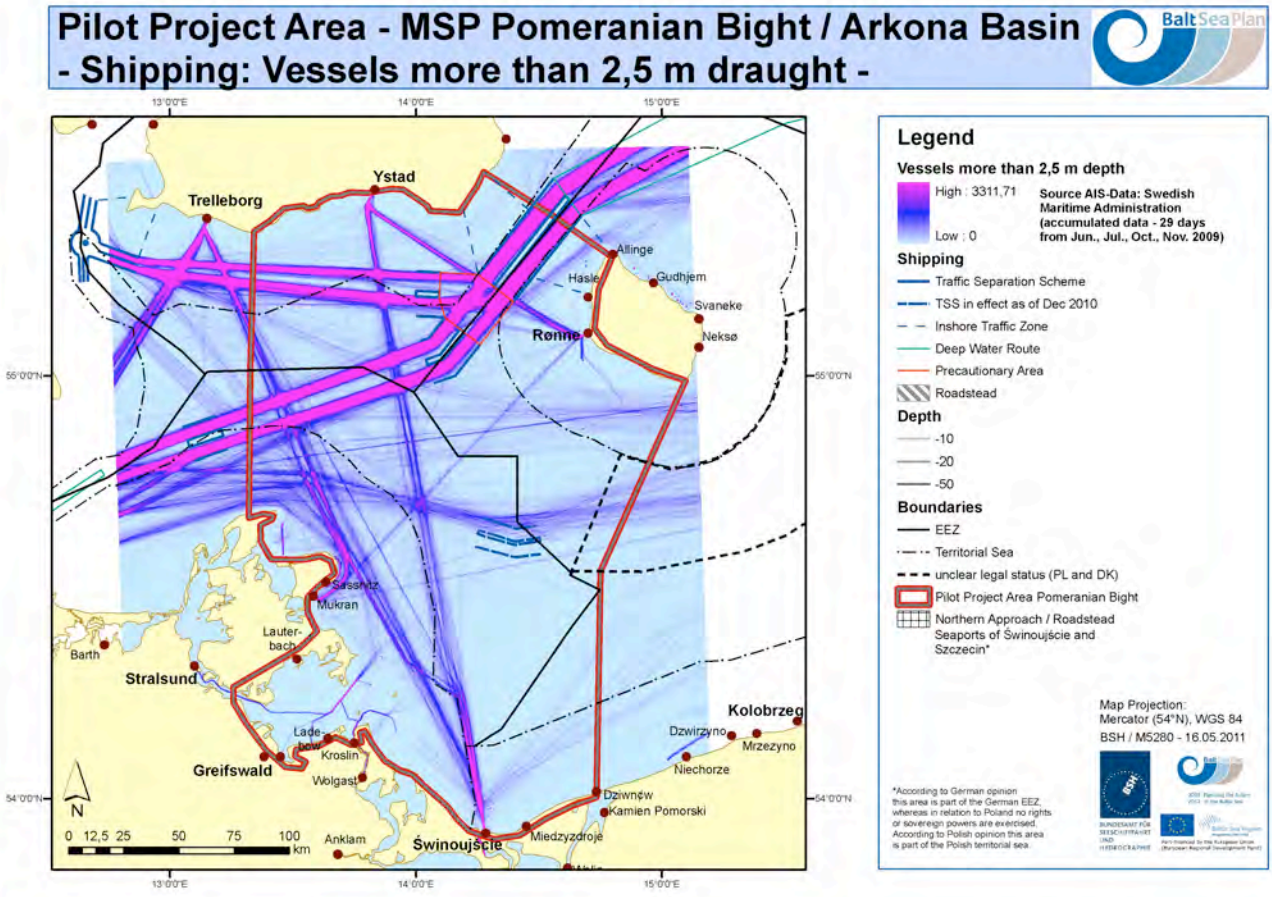


Fig. 14: Frequency of vessels in the pilot area with more than 2.5 m draught (additional data provided by Lantmäteriet, Sweden)

4.2.2 Nature conservation (Natura 2000) and other designations

The pilot area hosts one of the most important areas for wintering sea bird protection and some of the largest underwater sandbanks in the Baltic Sea which are listed as important habitats according to EU Directives. The pilot area is important for migratory birds and harbour porpoise and contains important cod spawning areas (see chapter 3.2.4 – 3.2.7). As a result, large areas of the pilot area have been designated as EU Natura 2000 habitats, national nature reserves and/or National Parks.

Specifically, nature conservation in the pilot area is characterized by:

a) the Baltic-wide importance of the area for wintering and migrating sea birds (long tailed duck, divers, velvet scoter, see chapter 2) This was reflected by the designation of large areas of the pilot area as MPAs (SAC, SPA).

b) the importance for marine mammals (harbour porpoise, grey seals) and as a very small stock and recovery area for seals (DE, DK)

c) Important habitat types are protected under the EU Habitats Directive (sandbanks, reefs) or have been nominated by DE, PL and DK.

d) The richness of habitat diversity was documented in the BALANCE landscape map, where the island of Bornholm and parts of the Greifswald lagoon achieve the highest score.

e) There are two National Parks in the pilot area: Jasmund on the island of Rügen and Wolinski National Park on Wolin.

No management plans have yet been approved for the Natura 2000 areas, although protection goals (including the habitat types and species to be protected) have been named. In the German EEZ, the process of developing management plans with regard to fisheries began in 2011.

Climate change is relevant for MSP with respect to coastal defence, although only minor sea level rise is predicted for the pilot area. Variability of biological communities is already high due to the diverse habitat conditions, although uncertainties remain with respect to cumulative effects and the potential of fauna to adapt to these (e.g. climate change plus human uses of the sea).

Information available:

- DE: MSP data for TS in M-V: reservation areas nature and landscape protection, habitat maps. M-V: Natura 2000: to be checked for activities on project level. Habitat maps for the EEZ from the BfN.
- Datasets (and respective maps) from DE, PL, DK, EU and HELCOM with regard to protected areas on national, regional and European level (Natura 2000, partly with more detailed fact sheets and management plans, also National Parks and national nature reserves)
- HELCOM spatial data on the abundance of wintering birds, on important spawning and nursery areas of cod etc.
- HELCOM report on biodiversity (many threatened Baltic Sea biotopes are located in the project area)
- Mammal distribution (harbour porpoise, grey seals)
- Maps (and potential datasets) by NordStream on the abundance of wintering birds, seals, harbour porpoises etc.
- Datasets on seasonal abundance of important bird species (long-tailed duck)
- BALANCE data on (modelled) sediments, habitats, benthic marine landscape etc.
- SE: geological data

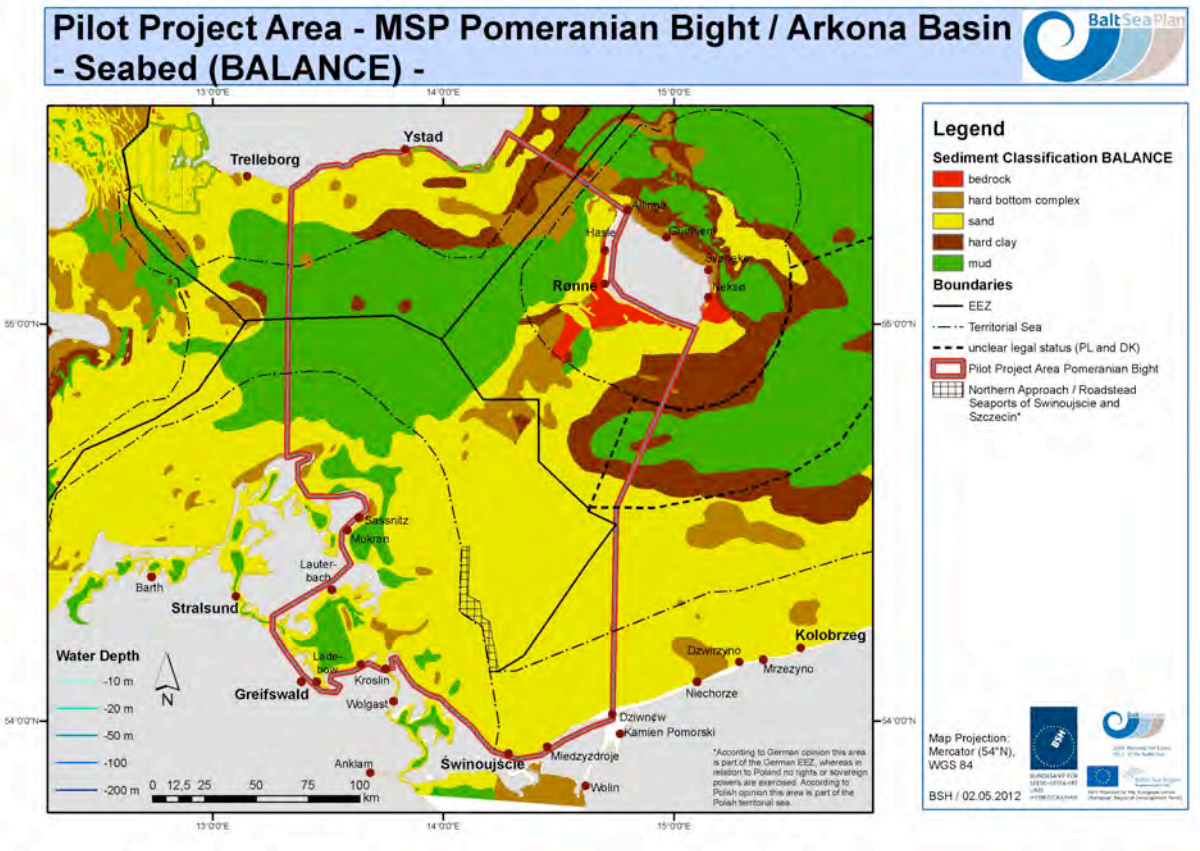


Fig. 15: Seabed classification according to BALANCE (additional data provided by Bergamt Stralsund)

4.2.3 Sand and gravel extraction and other raw materials

Compared to the other issues, activities seem limited. Sand and gravel extraction are expected to be stable in most countries, with coastal defence and port construction constituting the main drivers. Climate change is a driver that may increase the need for coastal defense and protection from flooding.

In the coastal waters of Mecklenburg-Vorpommern, some sand and gravel extraction is taking place in several designated extraction areas, primarily for coastal defence. Priority and reservation areas have been defined in Mecklenburg-Vorpommern's maritime spatial plan. In the EEZ some licences have been granted up to 2040 for sand and gravel extraction at Adlergrund; these however are not in active use and no priority or reservation areas have been designated in the MSP.

In Denmark, several extraction sites are currently in use at Adlergrund.

In Zachodniopomorskie, in the Lawica Odrzana (Oderbank), some areas have been designated as deposits of "technical sands and gravel" / "heavy minerals". At present, their extraction is not profitable; they are also located within a very valuable and important Natura 2000 area on the Oderbank. No GIS data is available on these.

Information available:

- DE: Data is available on licensed and planned extraction areas in M-V/the EEZ.
- DK: some areas are sand extraction areas, with a total of 7.605.000 m^3 authorized for Ronne Bank, Adlergrund, Bakkegrund and Klintegrund. There is a system of auctioning licences, but no auctioning is taking place in the pilot area.
- SE: no information is available on extraction areas within project area.

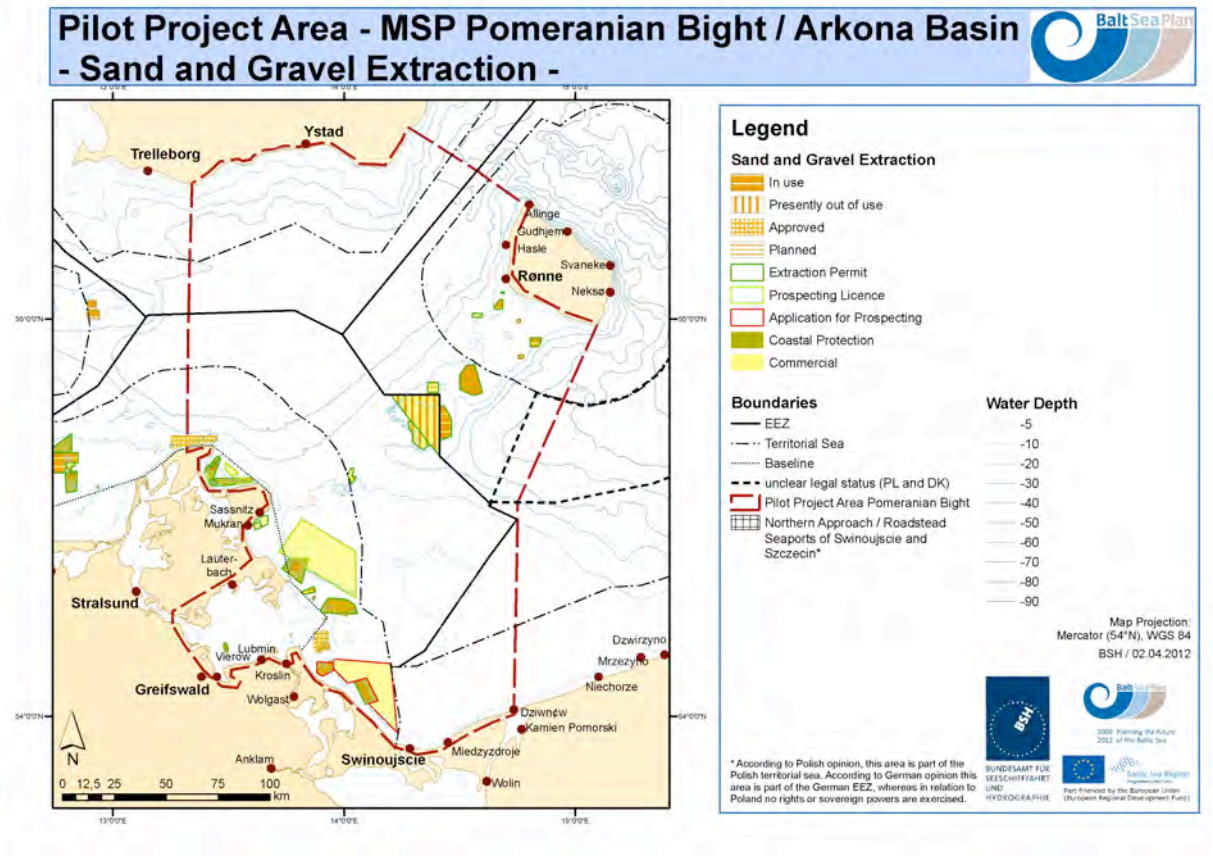


Fig. 16: Sand and gravel extraction in the pilot area (Note: The CONTIS data upon which this map is based are not up to date)

4.2.4 Fishery

Out of all sea uses, fishery has possibly the greatest impact on the sea floor. Beam trawling, which can occur in the same spot several times a year, alters the sea floor, destroys fragile reef structures or cuts off parts of bays or estuaries with fishing nets. Within the EU fisheries management holds special status as it is regulated by the EU Commission and only partly by the sovereign EU member states. As a result, fisheries management has always been treated as a separate issue and not been part of comprehensive approaches to regulating sea uses to date.

At the same time, fishery continues to be an economic factor. In Bornholm, fishery is the second most important economic sector; fishing also remains important in PL (see chapter 3).

The exact locations of the important areas for the different fish stages are only partly known. Information on important fishing areas (different target species and types of fishing) is available (e.g. for Germany from the EMPAS project), but limited in its applicability to MSP. For Sweden maps are available showing fishing intensity for some important target species, but little spatial information is available for Denmark and Poland. The reporting format for landing and catch surveys, based on large ICES rectangles, is so coarse that no area-specific delineation of management areas can be drawn from these. Attempts to obtain good data were made in a study done by IFAÖ on behalf of the Ministry of Transport of Mecklenburg-Vorpommern in 2007. Important spawning areas have been identified for cod and flounder e.g. in the Arkona Basin (from water depth of 20/40 m), and for herring in the shallow areas of the Greifswalder Bodden.

Fig. 17 indicates the spawning areas for herring. They are located at depths of up to 6 m on sandy substrate and in macrophyte habitats. The information for the spawning areas for cod has changed with time. Recent studies indicate that cod spawns in the Arkona basin at depths below 40 m and

even larger depths in the Bornholm Basin which partly extends into the pilot area south of Bornholm (Bleil, Oberst, 2007). The nursery areas for cod are also not well known. Older data indicate areas in the Arkona Basin itself stretching through the Bornholmsgat and southwards around Bornholm.

Non-commercial fish is also protected by the Natura 2000 sites. In the open sea this is sturgeon and twaite shad with very low densities (also present in the Greifswalder Bodden). Sturgeon is a small stock recruited from an ongoing reintroduction project in the Odra system.

In Germany, pelagic otter-trawling is spatially concentrated in an area north of Rügen island. Offshore gillnetting is concentrated at Adlergrund, the Western Rønnebank in Pomeranian Bay and the Kriegers Flak area. Most of the gillnet fisheries in the Baltic Sea are conducted by vessels < 15 m, without mandatory use of VMS. In the Baltic Sea, bottom-set gillnetting is very intense in the protected areas of Pomeranian Bay. There is high spatial and temporal overlap between the distribution of resting, moulting and wintering birds and fishing activities with bottom-set gillnets, suggesting conflict. This type of fishery is responsible for the high bycatch of seabirds and harbour porpoise in the Baltic Sea.

Trawling is prohibited in the 3 sm zone around Rügen island (with some seasonal exceptions). There is also a prohibition on certain fishing gear on the Oderbank[15], and voluntary agreements for the Greifswalder Bodden area (see literature).

Information available:

- EMPAS data / maps (DE waters) - Report ICES (2008)
- DK fishery maps (DK waters & DK ships, monthly, 4 years)
- Map on Fishery “traffic” (Swedish source, data covers only certain days in certain months as a sample)
- HELCOM: Data on fishery by gear (very coarse, ICES rectangles), spawning and nursery areas of cod, fishery closure area Oderbank etc.
- DE: maps fishing/angling restrictions in Greifswald Bay, Stralsund and vicinity
- SE: fishery efforts / catch for several fish species (only Swedish waters)
- NERI: maps on oxygen deficiency related to water depth

[15] Council Regulation (EC) No 88/98

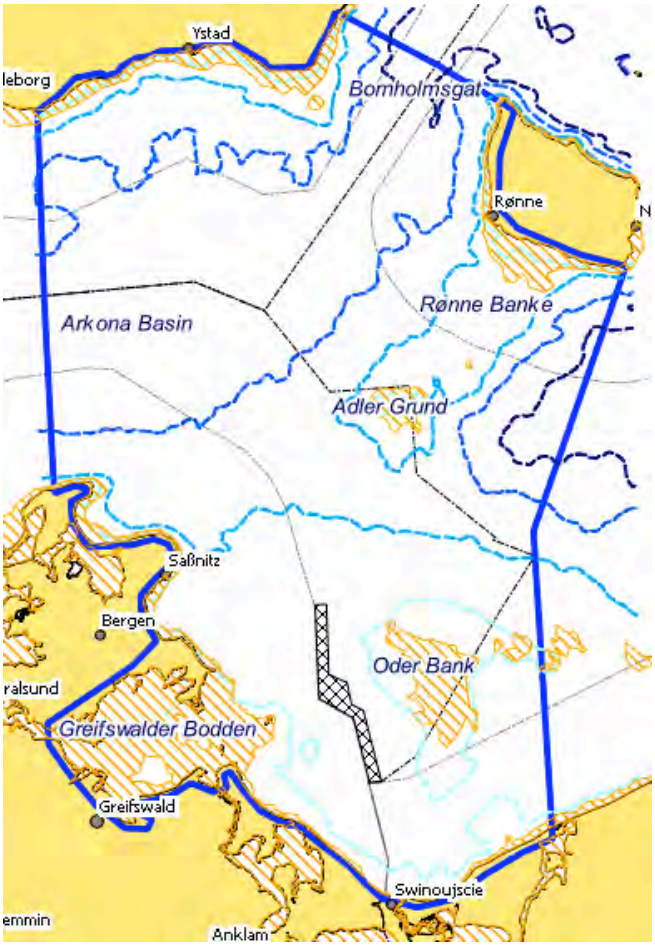


Fig. 17: Spawning areas for herring (hatched) (Source: BaltSeaPlan report 30, Schmiedel & Lamp 2012)

4.2.5 Offshore wind farming

Offshore wind farming is set to grow, although the significance of Baltic Sea installations is minor compared to the planned developments in the North Sea. Specific targets exist for offshore wind farming in most countries, either in terms of total MW to be achieved, or the total number of turbines to be built by 2030, or the total TWh to be generated. This, however, does not automatically translate into approved projects or project applications in all countries; nor is it necessarily clear where any prospective farms will be located.

In the pilot area, Denmark is planning two wind farms providing 200 MW each at Rønne Bank. In Germany, several applications have already secured approval both in territorial waters and in the EEZ, with two applications refused planning consent. Further developments are planned in the German share of the pilot area. In Poland a search for suitable sites was carried out in parallel to this project, and a wind farm is under consideration which would be located in the EEZ of the pilot area. Sweden is not planning any offshore wind farms in the pilot area.

Offshore wind farms represent a potential obstacle to migrating birds flying lower than 200 m above ground. Since the area contains important corridors for bird migration (see chapter 3.2.5), care must be taken to avoid the construction of tall structures in the bird corridors. It is also important to avoid the potential cumulative impacts of several offshore wind farms (see chapter 6 for an assessment of potential cumulative risks to birds).

Information available:

- Datasets and maps indicating offshore wind projects (DK, DE)
- DE: Maps with MSP regulations (BSH, M-V). No OWF are accepted within Natura2000 areas in the German EEZ (as stated in the maritime spatial plan for the EEZ). In the territorial sea of M-V, a suitable area has been defined for offshore wind farming (see chapter 6).
- PL: no OWF accepted within the boundaries of the territorial sea. No areas fixed yet within the project area, maybe one feasible area ("triangle", Polish potential areas for OWF). There are maps of potential offshore wind farms and concepts for offshore grid.
- PL for project area – wind speed, wind availability
- SE: no projects yet in project area

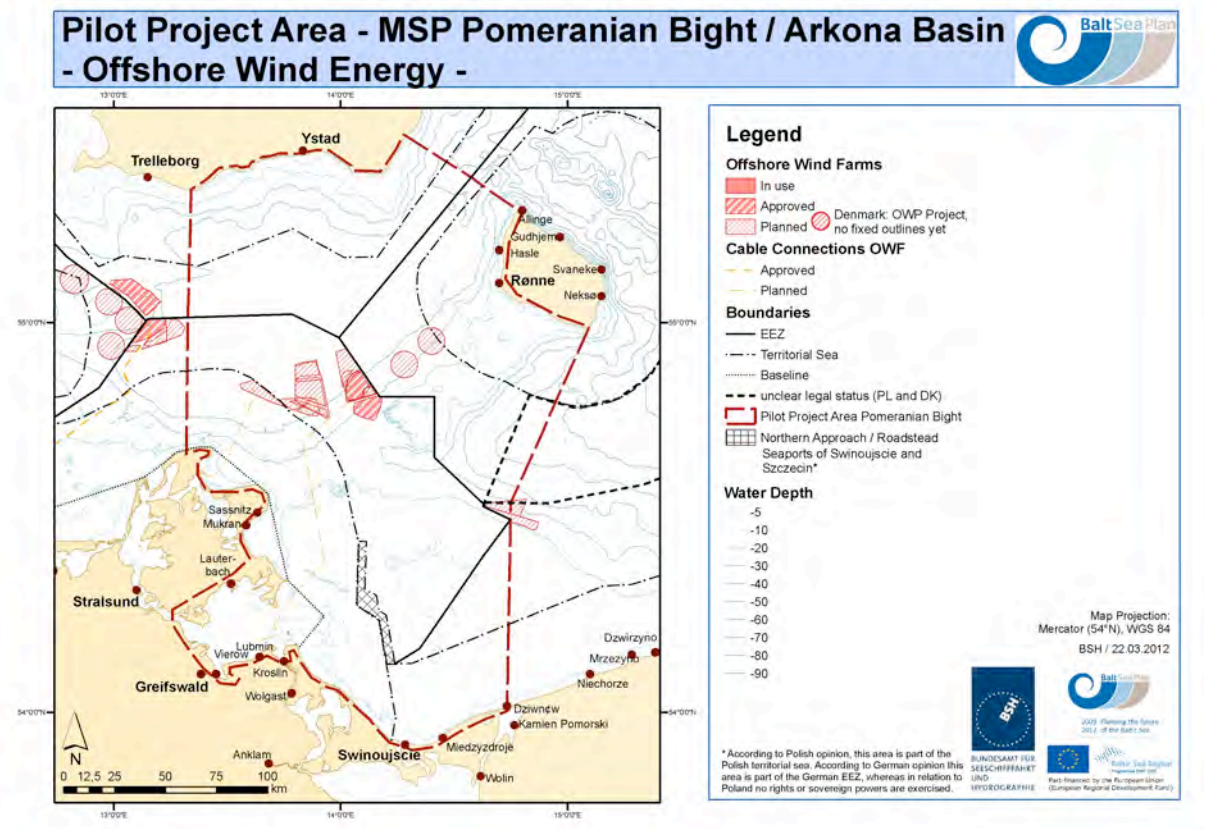


Fig. 18: Offshore wind farming (existing and planned) in the pilot area

4.2.6 Tourism

In principle the entire area is relevant for tourism, with beach holidays and sailing particularly popular. The significance of watersports for the economy is recognized in tourism strategies, and development concepts for small ports and harbours and marinas have been drawn up to maximise on this potential (e.g. the strategy for developing sailing on the Mecklenburg-Vorpommern coast, divides the coast into five zones, describes their significance for tourism and draws up development concepts for each). Development opportunities for maritime tourism are considered high in Mecklenburg-Vorpommern, relying mostly on the high quality of the coastal landscape, but also on the existing infrastructure such as ferry terminals. Structural adaptations are called for to take account of new developments, and strategic investment in infrastructure is considered key for sustainable tourism development.

For the pilot planning exercise, small harbours were not taken into account because their scale was too small. The same applies to the coast and its tourism infrastructure (marinas, hotels etc). Nevertheless, the planning exercise was aware of the impact of small harbour development on marine traffic with respect to a growing number of leisure boats. There was no detailed information on specific sailing areas, and no spaces have been assigned to any recreational uses. Tourism was thus primarily taken into account in the planning exercise through the quality of coastal environment.

Information available:

- Information from planning documents (e.g. DE: Tourism strategy 2010 Mecklenburg-Vorpommern)
- Spatial development plan Zachodniopomorskie and Mecklenburg-Vorpommern, local information from DK and SE

4.2.7 Cables and pipelines

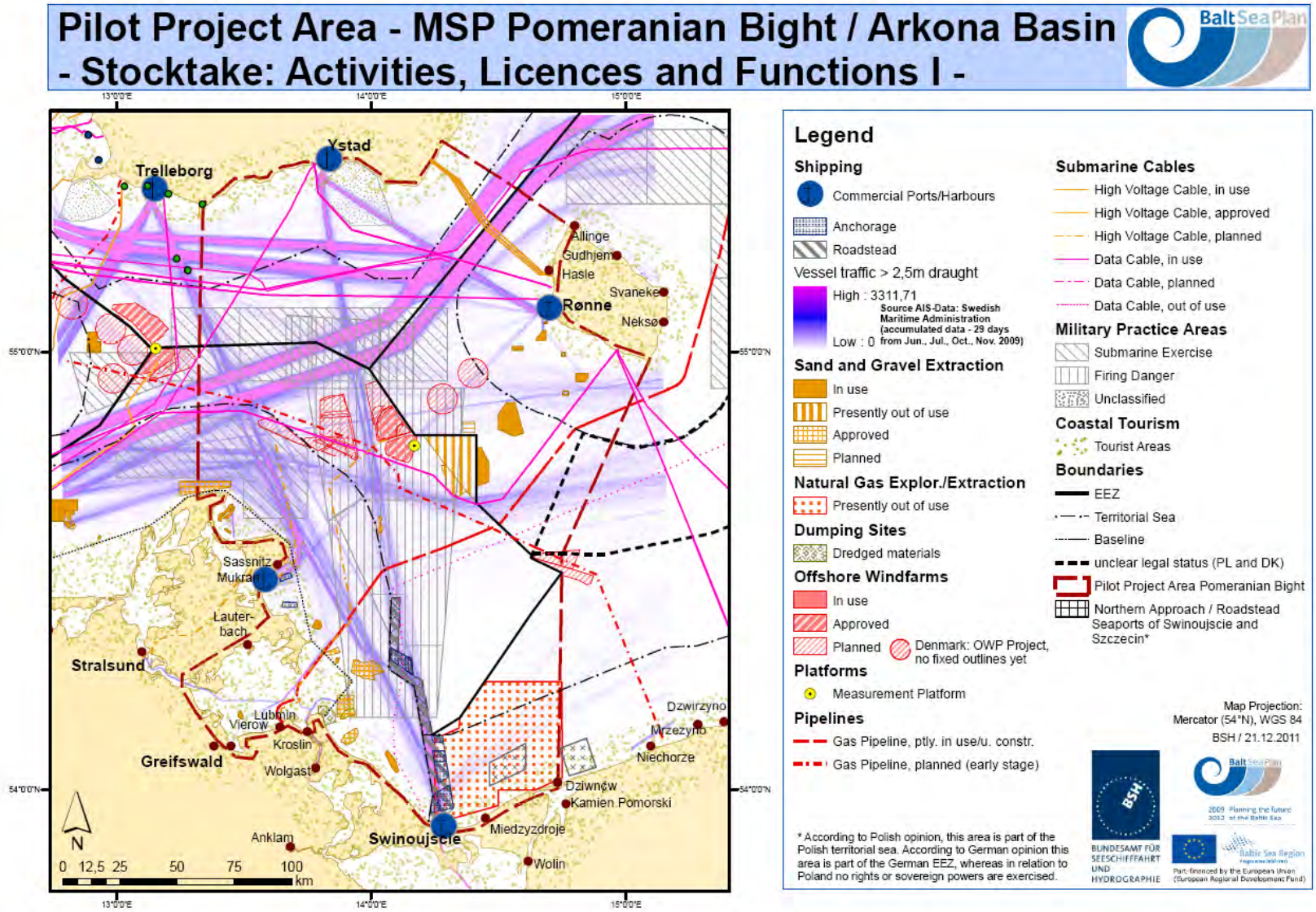
A range of different types of cables exist. In the context of this planning exercise, mainly transit cables were taken into account. Information on cables and pipelines is mostly readily available, although information on strongly used areas is not always consistent and there are some doubts concerning the reliability of the available data (up to date).

Information available:

- Data on submarine cables from SE, PL, DK, DE, although the type of cable is not always specified,
- Several “transit cables” from and to other countries in the Baltic Sea Region
- most cables connecting Bornholm to the mainland (PL, SE, DK)
- Some planned/approved cables for offshore wind farms in German EEZ and territorial sea
- Pipeline NordStream from Vyborg/Russia to Lubmin through Danish (Bornholm) territorial sea and EEZ, German EEZ, territorial sea and Greifswald Bay
- planned pipeline “Baltic Pipe” from PL (Niechorze) to DK - fomerly part of “Baltic Interconnection Skanled-Baltic Pipe”) – Skanled suspended in 2009, Baltic Pipe now projected as an export route for surplus gas from Poland’s planned LNG terminal at Świnoujście. No fixed route yet.

4.3 The stocktake map

All the above information was gathered and integrated into one stocktaking map (which is actually a challenge all in itself). The legend was mainly taken from existing CONTIS maps, others were developed during the project (BSH). The final legends were taken from legend templates developed for all pilot areas (BSH). There was no discussion on the legends within the pilot project apart from the boundary issues (Fig. 19).


Pilot Project Area - MSP Pomeranian Bight / Arkona Basin
- Stocktake: Activities, Licences and Functions I -
BaltSeaPlan
Ystad
Trelleborg
Allinge
Gudhjem
Hasle
Svaneke
Rønne
Neksø
Sassnitz
Mukran
Lauter-
bach
Stralsund
Lubmin
Vierow
Kroslin
Greifswald
Wolgast
Anklam
Swinoujscie
Miedzyzdroje
Wolin
Dziwnęw
Kamien Pomorski
Niechorze
Mrzezyno
Dzwirzyno
N
0 12,5 25 50 75 100 km
13°0'0"E
14°0'0"E
15°0'0"E
55°0'0"N
54°0'0"N
Legend
Shipping
Commercial Ports/Harbours
Anchorage
Roadstead
Vessel traffic > 2,5m draught
High : 3311,71
Low : 0
Source AIS-Data: Swedish Maritime Administration (accumulated data - 29 days from Jun., Jul., Oct., Nov. 2009)
Sand and Gravel Extraction
In use
Presently out of use
Approved
Planned
Natural Gas Explor./Extraction
Presently out of use
Dumping Sites
Dredged materials
Offshore Windfarms
In use
Approved
Planned
Denmark: OWP Project, no fixed outlines yet
Platforms
Measurement Platform
Pipelines
Gas Pipeline, ptly. in use/u. constr.
Gas Pipeline, planned (early stage)
Submarine Cables
High Voltage Cable, in use
High Voltage Cable, approved
High Voltage Cable, planned
Data Cable, in use
Data Cable, planned
Data Cable, out of use
Military Practice Areas
Submarine Exercise
Firing Danger
Unclassified
Coastal Tourism
Tourist Areas
Boundaries
EEZ
Territorial Sea
Baseline
unclear legal status (PL and DK)
Pilot Project Area Pomeranian Bight
Northern Approach / Roadstead Seaports of Swinoujscie and Szczecin*
* According to Polish opinion, this area is part of the Polish territorial sea. According to German opinion this area is part of the German EEZ, whereas in relation to Poland no rights or sovereign powers are exercised.
Map Projection: Mercator (54°N), WGS 84
BSH / 21.12.2011
BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE
Part-financed by the European Union (European Regional Development Fund)

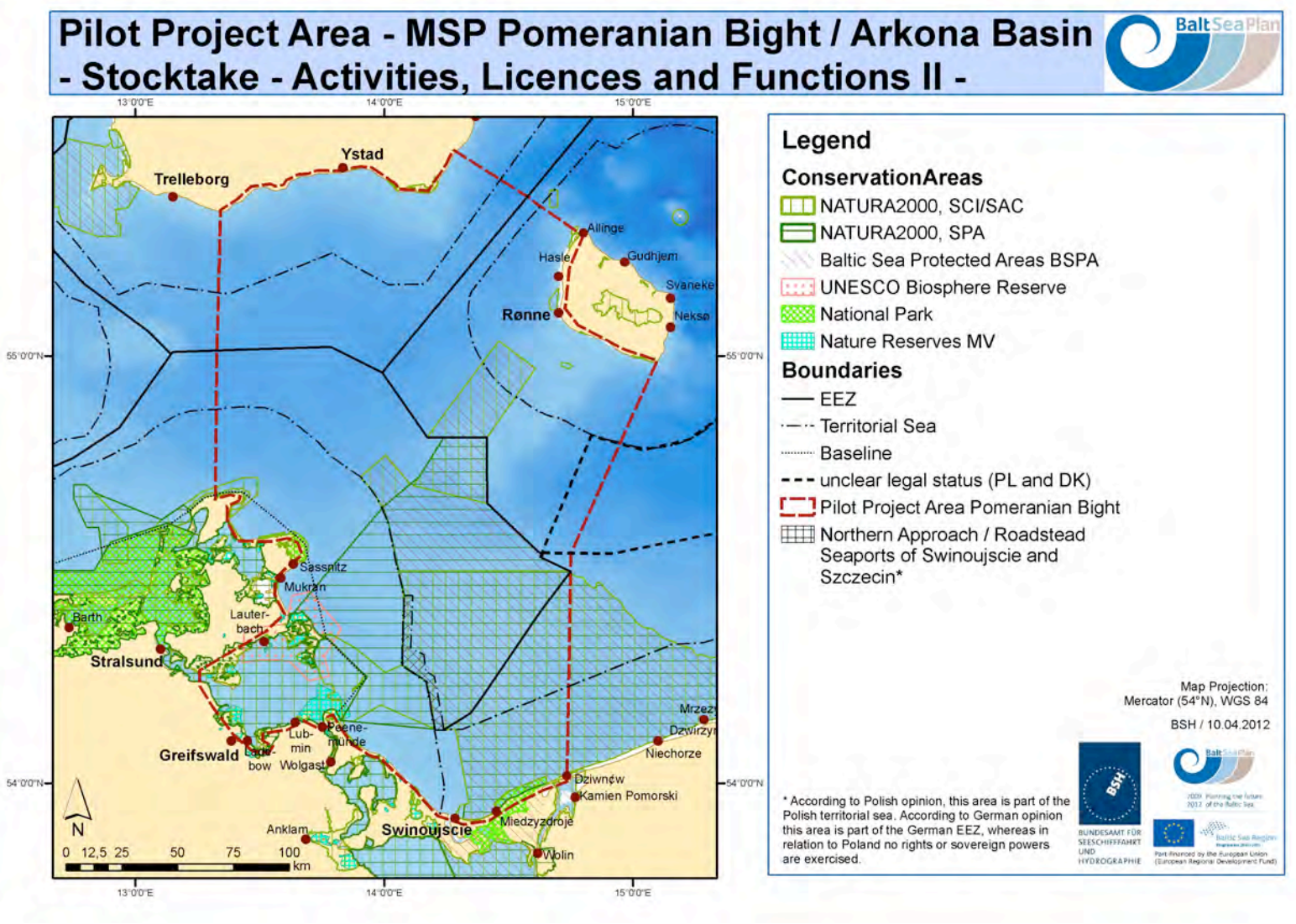


Fig. 19: Stocktaking maps for the pilot area

5. Conflict Analysis

5.1 Conflict potential of key uses

BaltSeaPlan report 8 (Gee et al. 2011) identifies the main conflict potential of key maritime uses. This assessment was done by all BaltSeaPlan partners at a general level, looking at the principal potential for conflict that comes with the respective sea uses. Taking a similar conceptual perspective, potential synergies were also identified where relevant. Generally speaking, the same potential for conflict also applies to the pilot area (Tab. 8), so this assessment can serve as useful background information.

Tab. 8: *Main conflict potentials and synergies identified for key spatial uses in the four countries (Partner's general estimate in principle, not exclusive to the pilot area)*

	DK	DE	PL	SE
Offshore wind farming main conflict potential	Nature conservation, shipping, landscape, fishing	Nature conservation, shipping, landscape, fishing	Nature conservation, shipping, landscape, fishing North Stream access to Swine-münde	Nature conservation, shipping, landscape, fishing
Offshore wind farming synergies	mariculture	mariculture	mariculture	mariculture
Ports and shipping main conflict potential	high risk area for shipping accidents, birds and marine mammals	environmental problems, dredging, disturbance of species	dredging; Gdansk: Natura 2000; North Stream pipeline. Conflicts between recreational boating & coastal defence.	shipping lanes in SE archipelago: risk of accidents
Natura 2000 main conflict potential	shipping lanes, no buffer zones to Natura 2000 sites (danger of oil spills, collision),	no wind farms allowed in EEZ Natura 2000 sites. Main threats mining, fisheries (bottom trawling), OWF (birds), shipping (no major prob.), sand and gravel extraction.	shipping, dredging, destructive uses (trawling), OWF (birds), mining, fishing (potentially) alien species from ballast water	shipping, dredging, destructive uses (trawling), OWF (birds), mining, fishing (potentially) alien species from ballast water
Natura 2000 main potential for synergies		possibly fishing (dep on manage-ment plan)		

Sand, gravel, oil & gas extraction main potential for conflict	everything except shipping and tourism;	everything except shipping and tourism. Overlap sand and gravel extr. sites and Natura 2000 in MV and in EEZ. Approval procedure EEZ pending.	everything except shipping and tourism;	everything except shipping and tourism;
Sand, gravel, oil & gas extraction main potential for synergies		conceivable: oil and wind farms in spent sites; CO2 and LNG storage in former oil and gas chambers, pits used as dumping sites or for OWF or mariculture		

5.2 Results from the stakeholder process: conflicts identified (or anticipated) in the pilot area by stakeholders

Most of the stakeholders involved in the pilot planning exercise confirmed the existence of conflicts in the pilot area. They described the pilot area as intensively used and predestined for future conflict (see table below).

Tab. 9: Stakeholder activities in the pilot project area and expected conflicts (result of self-assessment)

Stakeholders per country (no. of respondents)	active in the pilot area	activities planned	experience conflicts already	expect conflicts
PL (15)	8 (within 5 nm of pilot area)	9 (3 maybe)	13	13
DE (9) (first contact in 2010, no second approach in 2011)	7	5	8	6

The specific conflicts raised by the stakeholders were similar across the countries, but differed in their specificities according to context. In Sweden for example, oil spills and tourism were raised as a specific possible conflict. At the German stakeholder meeting, the main conflicts identified were those between offshore wind farming and shipping, fishery and nature conservation (depending on the type of fishery), and nature conservation and many other uses. Stakeholders also mentioned sand and gravel extraction and transnational cables and pipelines as additional points of conflict, with the latter seen to be planned without consulting any other interests. Water quality was raised by Polish stakeholders as an issue, as was the Nordstream pipeline as a bad example of MSP (or lack thereof). Stakeholders also acknowledged that situations can and do change, making conflict assessment a snapshot of a particular situation.

5.3 Drawing up a conflict matrix in Poland

The results of the stakeholder conflict assessment can be shown in a conflict matrix, such as this one showing the results for the Polish share of the pilot area. In the remainder of the pilot area, other conflicts may occur or be of different weight. Empty boxes denote that these conflicts were not identified for Poland. Conflict matrices such as these are also useful for identifying those conflicts that cannot be resolved by MSP alone, but require the support of management plans or voluntary agreements.

Tab. 10: Conflict matrix drawn up for the Polish share of the pilot area

□ conflicts -1 □ weak conflicts -2 □ no conflicts identified	Offshore wind farms	Marine protected areas	Fisheries	The sea as a public good	Cables	Tourism	Shipping and shipping routes	Harbours and ports	Agriculture/run-off	Sand and gravel extraction	Oil and gas exploration	Dumping of dredging material	Mariculture	Coastal service centres	Nature conservation	Coastal protection	Military use
Offshore wind farms			1	2	1	2									2		
Marine protected areas			1	2	1	2	1	1		1		1		2			1
Fisheries	1	1			1		1			1		1			2		1
The sea as a public good	2	2					2	2		1		2					1
Cables	1	1	1				1			1		1			1	2	
Tourism	2	2													2	2	1
Shipping/shipping routes		1	1		1							1			1		1
Harbours and ports		1				2									1		
Agriculture/run-off																	
Sand and gravel extraction		1	1	1	1										1		
Oil and gas exploration																	
Dumping dredging material		1	1	2	1		1								1		1
Mariculture																	
Coastal service centres		2													2		
Nature conservation	2		2		2	2	1	1		1		1		2			1
Coastal protection					2	2											2
Military use		1	1	1		1	1					1			1	2	

Note: The term *Marine protected areas* is understood as the areas protected by law (e.g. Natura 2000), whereas the term *Nature conservation* refers to conservation of nature (marine environment) generally.

In Germany, a stakeholder meeting with NGOs and industry representatives also identified a range of conflicts in the pilot area (see below). Participants included those stakeholders that had expressed an interest in being involved when first contacted, plus some additional selected contacts. Results from Poland and Germany have not yet been translated into a joint conflict matrix for the pilot area.

5.4 Overview of sectoral interests, conflicts and synergies identified by stakeholders in Germany

Blue = potential conflicts
Red = existing conflict
Green = synergy

	Main Interests	Shipping / Transport	Offshore Wind Farming / Energy	Sand and Gravel Extraction	Fisheries	Mariculture	Science and Research	Cables / Pipelines	Recreation / Tourism	Trade and Industry	Cultural Heritage	Military Use	Nature Conservation	General Remarks Knowledge Deficiencies / Trends and Developments
Shipping / Transport			Potential conflict – MSP to secure safe main navigation routes										Possible conflict with Natura 2000 areas; conflicts with respect to water quality	
Offshore Wind Farming / Energy	• Promotion of OWE in marine areas, energy transition, industry interests, use of suitable areas (water depths, substrate types etc.), • Keep suitable areas as large as possible for future expansion, test sites etc.	General conflict – no shipping of vessels beyond 24 m in OWF		Conflict: No extraction allowed within wind farms (DE)					Conflict – Visual impact in coastal areas (DE), minimum distance from coast is required Leisure and fishing boats of up to 24 m can cross wind farms (DE)			Conflict with submarine exercise areas These areas are not exactly delineated and are therefore difficult to take into account (e.g. emergency routes)	Conflict Management measures needed during construction to mitigate negative impacts; use MSP to set buffer zones. A coherent approach is needed throughout the project area – In Germany for example, there are different definitions of no go area for offshore wind in Natura 2000 areas: – definitely no OWF in Natura2000 in EEZ[16] but possibly elsewhere.	• Consider future trends, e.g. alternative energy generation, CCS, servicing platforms – leave areas open and free from fixed installations • Determine what can be tackled by means of MSP and what measures will need to be taken at project level.
Sand and Gravel Extraction	• Securing suitable sand deposits / extraction sites esp. for coastal		Conflict – no extraction allowed within wind farms										Conflict - but the EU Working Paper „Non-Energy Mineral Extraction and	• European Raw Materials Act as a driver • For a more

[16] See “Guidelines to reconcile wind energy development and biodiversity policy” (EU Commission, October 2010)

	Main Interests	Shipping / Transport	Offshore Wind Farming / Energy	Sand and Gravel Extraction	Fisheries	Mariculture	Science and Research	Cables / Pipelines	Recreation / Tourism	Trade and Industry	Cultural Heritage	Military Use	Nature Conservation	General Remarks Knowledge Deficiencies / Trends and Developments
	protection purposes • Priority Areas for sand & gravel needed • Future needs to be secured • Permits issued up to 2040 • 3 applications for partial areas at Adlergrund currently being considedere by LBA • International approach to find / use best suited deposits with regard to quality and impacts • Use synergies / co-use with other activities • Interest in achieving economically viable solutions for all												Natura2000“ shows there should not be a general closure of all Natura 2000 areas to sand and gravel extraction	comprehensive knowledge base of deposits: BfN /LBA/VSI pilot project to identify possible extraction sites, amounts, timeframes for extraction etc.
Fisheries		Conflict with main shipping routes	No trawling allowed wihtin wind farms Passage through OWF for vessels under 24m,	Conflict									Conflicts	• Conflicts depending on type of fishing / fishing gear used / species targeted • Proposed solutions for fishery management in Natura2000 areas (German EEZ) ➔ all-year and temporal closure to use of certain gear • Data / Information not sufficient – fish in different stages of their life cycles etc., fishing efforts, needed to identify negative impacts

	Main Interests	Shipping / Transport	Offshore Wind Farming / Energy	Sand and Gravel Extraction	Fisheries	Mariculture	Science and Research	Cables / Pipelines	Recreation / Tourism	Trade and Industry	Cultural Heritage	Military Use	Nature Conservation	General Remarks Knowledge Deficiencies / Trends and Developments
														and competition – and to be able to designate e.g. suitable areas for fishery
Mariculture														• no final concepts as yet, could replace coastal fisheries in the longer run, • more data needed to assess suitable areas and general conditions for non harming operation • opportunity in introducing filtering species, other more intensive farming currently not promising
Science and Research			No research vessels allowed in OWF											• Future research topics – use of mussels in water management in estuaries for reducing nitrogen intake from rivers • Climate change impact on ice cover, species to protect ... • Concern about loss of measuring sites/stations
Cables / Pipelines											Conflict in coastal waters: historical artefacts, wrecks etc. to be considered, might have to be (re)moved		Conflict if dredging is needed and if electrifc fields build up along cable route. Conflicts also in the context of seismics, laying of pipeline, drilling	
Recreation / Tourism	• Leisure Sailing: Preserve grown freedoms, use whole marine												Conflicts arising from tourist infrasturucture / tourist use in / close	• No real figures available on use, on most important areas etc., no

	Main Interests	Shipping / Transport	Offshore Wind Farming / Energy	Sand and Gravel Extraction	Fisheries	Mariculture	Science and Research	Cables / Pipelines	Recreation / Tourism	Trade and Industry	Cultural Heritage	Military Use	Nature Conservation	General Remarks Knowledge Deficiencies / Trends and Developments
	area • Areas of interest emerging funnel-shaped from all harbours												to valuable coastal habitats Conflicts arising from the use of water space can be resolved bilaterally by means of management plans, self-restrictions etc.	practical way for analysing routes of small craft / sailing for MSP • Data gaps with regard of impact on other users/functions (which intensity, which impact? • Take into account future trends and developments, such as floating homes/cities or other use of marine space
Cultural Heritage		Potential conflict – dredging for shipping routes	Potential conflict – dredging for and construction of turbines might impair heritage sites											• no public maps available on sites to prevent from looting and damage
Military Use														
Nature Conser-vation	• Corridors and connectivity between (protected) areas, refuge areas	Conflict with bird migration, bird wintering and resting areas mainly away from the TSS and major shipping routes	Conflict with bird migration, bird wintering and resting areas (flight distances with regard to random ship traffic from leisure and fishing boats etc.), Adlergrund as a special area of conflict	Conflict, especially on Adlergrund	Conflict due to damaging fishing gear and unsustain-able fishing efforts, respective manage-ment plans and plans enforce-ment needed					Conflicts with Natura 2000 sites				• Take species-specific view when assessing impact (varying flight distances, levels of adaptation to disturbances etc.) • Cumulative impacts – shifting e.g. habitats, and finally loss of habitats ➔ forecast of shifts needed (e.g. asked for for EU fishery closure areas), knowledge on if and how fauna might adapt to new circumstances • Adlergrund as a concentration point

	Main Interests	Shipping / Transport	Offshore Wind Farming / Energy	Sand and Gravel Extraction	Fisheries	Mariculture	Science and Research	Cables / Pipelines	Recreation / Tourism	Trade and Industry	Cultural Heritage	Military Use	Nature Conservation	General Remarks Knowledge Deficiencies / Trends and Developments
														for different interests (habitat/birds/sand and gravel extraction/offshore wind farming and shipping) • A differentiated approach is necessary to Natura 2000 areas (differentiating between different areas within designated Natura 2000 areas)

5.5 Mapping the main conflicts of use in the pilot area

The stocktaking maps were presented at stakeholder meetings in Poland and Germany in order to corroborate and extend the conflict analysis. Stakeholders confirmed the range of conflicts identified, but also gave more specific and detailed information for the respective national shares of the pilot area. This additional information and the participative approach used to obtain it makes it easier to deal with conflicts in an appropriate way.

Based on the stocktake and the assessment of conflicts, a conflict map was drawn up to visualise the results of the stocktake. The overlay of the various information layers shows the current and potential conflicts between sea uses across the pilot area and gives a first indication of where the conflict 'hotspots' are located. Hotspots could arise from a number of factors, such as the sheer quantity of uses in a particular area, or the fact that particular areas are particularly sensitive from an ecological point of view, of that uses come together that are spatially incompatible.

The primary group of conflicts identified for the pilot area are as follows:

- Shipping vs. offshore wind farm development
- Offshore wind farming vs nature conservation (Natura 2000)
- Nature conservation vs sand and gravel extraction
- Nature conservation vs fishery and leisure boating.

It became clear that most of the conflicts identified have a transnational element, which justifies a transnational MSP process in this particular pilot area.

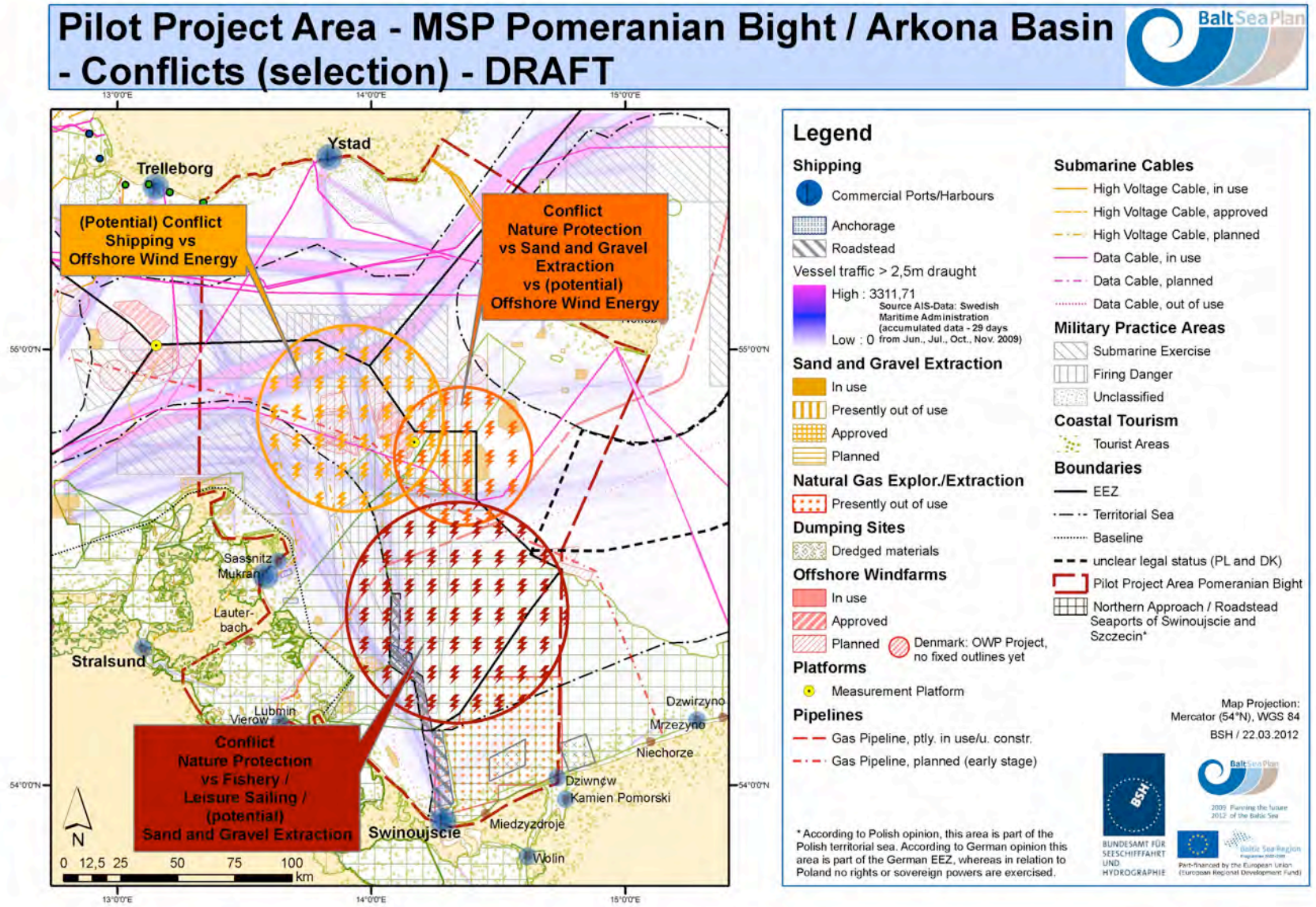


Fig. 20: Conflicts identified in the pilot area

6. Methods for dealing with the identified conflicts (applied methods) and solutions (scenarios)

Having completed the stocktake, and having identified the main potential conflicts in the pilot project area, the planning team was now confronted with the difficult situation of balancing these interests whilst also maintaining a healthy marine environment. A number of methods were tested to develop potential solutions, such as modeling or the use of decision support software. The results of these methods were fed into the discussion process that led to the development of the actual maritime spatial plan.

6.1 Integrating modelling data into the MSP process

Modelling data and tools are potentially beneficial to a variety of planning related questions and problems. An important first step towards integrating modelling into the MSP process is to identify specific MSP related questions and problems from a planners' perspective and to assess to which extent models and model results can contribute to these requirements. Models can supplement field observations and assessments (e.g. to fill observational data gaps, to investigate and understand processes, to carry out 'what happens if' scenarios) and assist in setting ecological targets in order to fulfill legal obligations with regard to existing EU Directives (Water Framework, Habitats and Marine Strategy) and other international conventions and agreements (e.g. "Rio biodiversity" and HELCOM). However, models and modelling results have to be carefully tested for their applicability, quality and validity. In addition, the use of models for maritime management not only depends on the quality of the output, but also on the available range of relevant model products and the spatial and temporal scales they operate on. (see also BaltSeaPlan report 19 "Modelling for Maritime Spatial Planning – Tools, Concepts, Applications", Mohn et al. 2011)

One of the MSP priority areas is to identify suitable locations for offshore wind energy. Site selection and decision support tools such as Marxan provide a potentially powerful tool to support the planning process for offshore installation (see the Pomeranian Bight case study next section). Both environmental, economic and data from other uses serve as input for different decision site selection scenarios. In this context, model output could for instance contribute information on wind and wave conditions and variability.

Seabed studies were carried out in the Danish pilot area (see the relevant BaltSeaPlan report 27 "Seabed and habitat mapping in the Hatter Barn area - a high risk area for shipping in the Danish Straits", Dahl et al. 2011)

Model data provide a large amount of information on spatial and temporal patterns of ecological key parameters. This information has to be carefully synthesized based on usefulness and relevance for important planning questions (e.g. environmental extreme events, habitat sensitivity, etc.).

Ecological model data can generally contribute to:

(1) improving existing knowledge and data gaps of ecological indicators and their linkages,

(2) improving/updating pressure and sensitivity indices,

(3) providing dynamic, geospatial layers for GIS web services (e.g. HELCOM – BALANCE, Nordstream), and

(4) providing initial/boundary conditions for geospatial modelling frameworks (Multi Criteria Analysis, Marxan).

6.2 Using Marxan software in decision support

The use of decision support software is an accepted tool in conservation planning as it can help to work towards balanced decisions in a systematic way.

The Marxan software is a site selection tool that has its origins in marine conservation planning. Developed to provide decision support for systematic conservation planning, it uses an optimization method for site selection, searching for the most cost-effective suggestions for suitable marine conservation areas that meet a number of ecological, social and economic targets. Results can be influenced by changing parameters such as clustering, or altering the importance of different targets (Ball et al. 2009, Ardron et al. 2010).

To run Marxan, the ecological potential of the area, the conservation targets, the influence of conflicting uses and other factors need to be evaluated beforehand and converted into data. After feeding the data into the model, the information is processed and scenarios are produced. The tool can therefore easily be adapted to all manner of site selection analyses as long as the planning question can be phrased in such a way that it corresponds to the way Marxan handles a problem. The advantage of Marxan is that scenarios can be developed, which can then be taken as a basis for finding solutions.

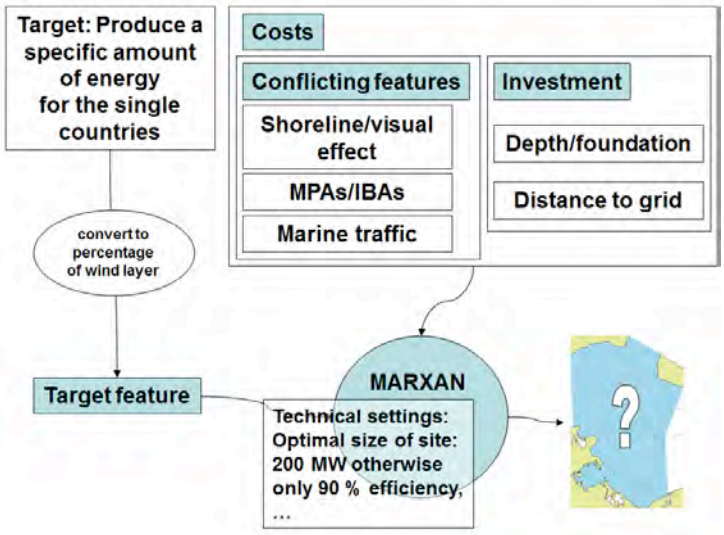
In this case study, the idea was to use Marxan to identify potentially suitable areas for offshore wind farming. This is no easy task since offshore wind farming directly competes with other uses and large parts of the pilot area are already taken up by important habitats, bird areas and shipping. There is also a free horizon policy for tourism, limiting the possibility for designating suitable sites nearshore. The case study took a transnational approach to the pilot area, seeking to identify those sites that have the lowest construction costs, make optimum use of the available wind and take account of the various spatial restrictions.

It is important to note that a decision support tool just illustrates options. The modelling of scenarios results in working documents and maps that can support the planning process, but these outputs do not represent final planning decisions. As a basis for discussion, however, such outputs are highly useful: Maps can be used to support stakeholder involvement, or compared to the real case planning documents, or used as a possible scenario in a cross-country approach to find the most suitable sites.

6.2.1. Applying Marxan to compare suitable sites for offshore wind power in the pilot area Pomeranian Bight

Offshore wind farming is in direct conflict with other uses. The following "ground rules" were established as important planning objectives which were not to be impeded by offshore wind farming:

- Maintain functional maritime transport and ferry connections: Transport-Link North-South (ferry connections), East-West (transit-) traffic and the relevant ports.
- Secure the value of the area for (maritime/coastal) tourism.
- Protect the sensible and valuable natural environment, among others important wintering birds areas and spawning area of Baltic Herring.



Marxan for offshore wind power

A study area for Marxan is divided into **planning units**. The input features for Marxan are grouped into **target features** and **costs**. Typical **planning units** for Marxan are often hexagons, which has the advantage of a regular representative size and regular boundaries between the single planning units. The planning units are selected during the iteration process and all spatial information is aggregated on them. For the **target features**, targets can be set as percentage or area/amount. Different targets are set for the single features and their importance is adjusted by means of a penalty factor. Coarse filters, e.g. administrative borders, can be applied if equal distribution of the sites is desired.

Unlike the target features **costs** are merged into one input layer. It is therefore necessary to estimate the relative influence of the different cost components more thoroughly than for the target features.

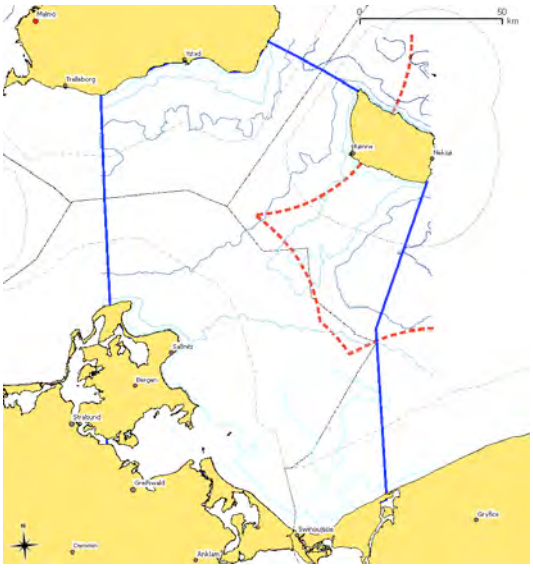
There are additional options, e.g. to handle biological constraints by influencing the distance between selected sites, or the size of patches, or fine-tuning the output by setting penalties for the different conservation features if not all targets can be met.

These spatial constraints had to be translated into a format that could be handled by Marxan. Generally, the input to Marxan is made up of different layers, representing the revenue of offshore wind farming on the one hand and the costs incurred (the constraints) on the other. Marxan also requires an overall target, which in this case was to produce a specific amount of energy for the entire pilot area (alternatively, country targets could also be used). This target is influenced by wind availability, so a map of the mean wind speed at 100 m was used as a basis for calculating the average capacity of sites to produce energy. As this is a simplified model, differences in the pattern of wind distribution, air density or the design of the wind farms were neglected. The profit from selling wind energy was calculated for a period of 25 years (assuming 96.5 €/MWh) and the results related back to the investment costs to arrive at an estimate of revenue.

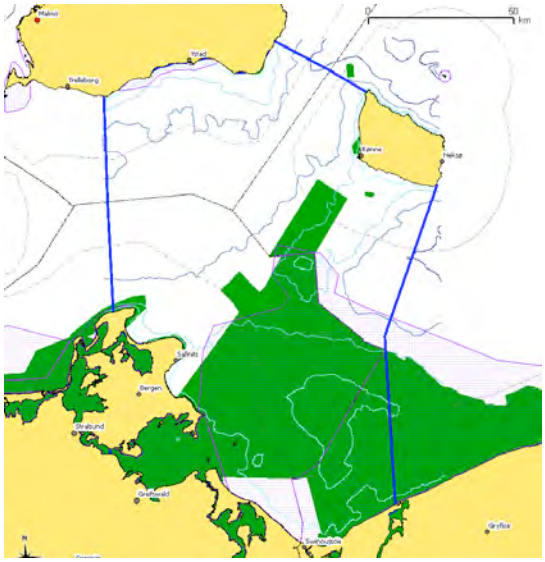
The cost layer comprises investment costs for offshore wind farms on the one hand, and conflicting features on the other. Investment costs for offshore wind farms were taken to be only those that depend on the physical environment and vary according to site conditions such as cables and foundation costs; maintenance costs were not included. Foundation costs depend on bathymetry, so

water depth was used as the input layer here. Cable connection costs were approximated by using the shorelines (except for Bornholm) as a basis for calculating the distance to the next grid. A constant of 50 was used for cable lengths greater than 50 km; the assumption was also that 200 MW would be connected to one cable.

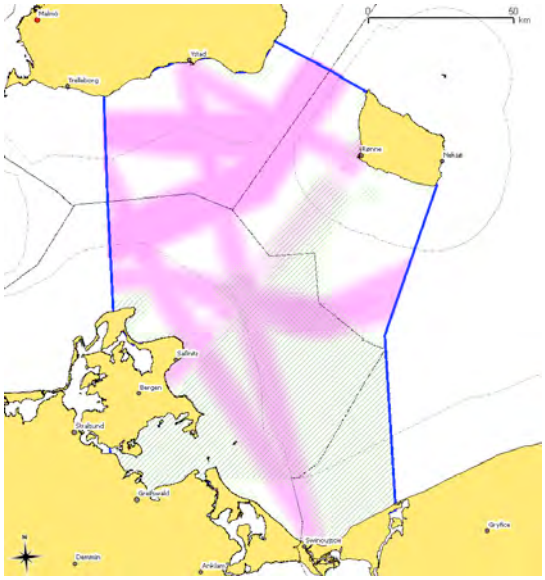
Conflicting features, and the cost values assigned to them, are a key element in producing the scenarios. Three features were taken into account. The first is the visual effect of offshore wind farms when seen from the coast. The cost value for protecting the visual amenity of the coast was set at a high constant of 50 for a zone of up to 20 km from the entire shoreline. The second feature is shipping. Cost values for the transport and ferry connections in the pilot area were set depending on their importance, with the highly frequented routes receiving a high cost value and the ferry connection from Sassnitz to Rønne a low cost value. A security buffer of 2 nm plus 500m was set for the highly frequented routes and traffic separation schemes, and of 1 nm plus 500 m for all other connections. In the buffer the cost was gradually reduced to 0 with increasing distance from the shipping route. The third feature is nature conservation. For simplified modelling, Natura 2000 areas were chosen to represent all areas with ecological importance, with spawning areas not taken into consideration. Natura 2000 areas were also given a high cost value of 50 (the same as visual amenity). Some examples for the inputs are shown below (Fig. 20).



Construction costs (here: water depth and cable connections as basic parameters)



Natura 2000 areas (source: project partners)



Shipping routes

The “cost inputs” shown here define areas that will be considered unsuitable for offshore wind farming and therefore excluded in the model outputs.

Fig. 21: Examples for “cost inputs” into Marxan: Selected conflicting uses

Three of the scenarios produced by Marxan are shown below. On the left is a scenario that was modelled based on the settings assumed by the respective national plans. The centre scenario assumed double the energy production as a target. On the right is a scenario that neglects cable connection costs and also assumes higher energy production as a target compared to the basic scenario.

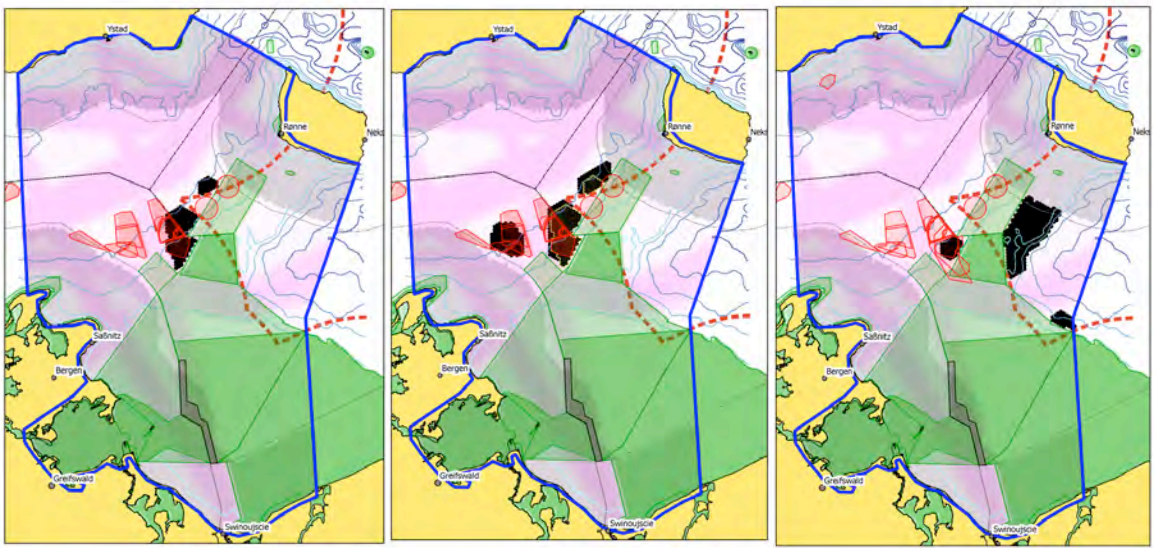


Fig. 22: Three scenarios for offshore wind sites selected by Marxan. Black area: sites selected by Marxan. Red hatched areas: Offshore wind farm sites indicated by national plans. Pink lines: Shipping routes. Red dashed line: 50 km line for cable connections. Grey: Visibility belt from the coast. Green: Natura 2000
Left: Basic scenario with a target of 218 km^2 for mean wind availability, best solution by Marxan (black) compared to the sites under consideration by national plans. Centre: Double the energy production compared to the basic scenario, shown is the best solution by Marxan (black) compared to the sites under consideration by national plans. Right: In this scenario the cable costs are neglected, the total site size is the same as in the basic scenario. Shown is the best solution by Marxan (black) compared to the sites under consideration by national plans

Although the selected areas in the basic scenario (left) do not correlate perfectly with the plans of Germany and Denmark, they support the general placement of sites. The small differences can be explained by slight differences in the datasets used and the flexibility of manual designation compared to the fully automatic modelling. Marxan was set to exclude Natura 2000 sites as potential offshore wind farming sites for example (note the Danish suitable sites were designated before the Natura 2000 site was established).

6.2.2 Lessons for using Marxan as decision support tool in maritime spatial planning

Although it has some limitations, the test case shows that Marxan can be successfully applied to the case of offshore wind farming. Marxan is particularly useful when it comes to refining targets and conflicts. During the first runs some of the settings were changed due to unexpected effects of some of the target or conflict definitions. These changes can easily be documented and several setting tested so that the whole process of finding suitable sites becomes transparent. Added scenarios that can be tested include even greater energy demand, or the influence of the state of the art for cable connections and super grid design. Other settings, e.g. steering the patch size of the selected sites that are connected with each other, could not be tested with the chosen basic settings.

A key advantage of Marxan is that it shows up data gaps and the difficulties of parameterisation. Whilst the investment costs for offshore wind farming can be readily calculated, assigning cost values to nature conservation is an arbitrary exercise (how much is a Natura 2000 site worth?). Also, not every conflict can be put into figures, so that the scenario maps may look deceptively complete but not really reflect the complete real situation.

In the case of the pilot project, the required data input was collected by the working group during the stocktaking process and conflict analysis. Frequent feedback was necessary, e.g. when gaps in data or in the conflict definitions were identified. Once the conflicts in an area were defined and targets set by the planning group, however, Marxan helped to show different options and the consequences (advantages and disadvantages) associated with each. Solutions then need to be found as part of the planning process.

Much of using Marxan depends on the work of the planning group and their understanding of how to use a decision support tool. Therefore close contact between the modeler and the planning group is advantageous. It should also be kept in mind that the results are directly influenced by the chosen simplified settings and should not be over-interpreted.

6.3 Fisheries as a special issue

The main problem with fisheries is that it is not usually treated as a spatial issue. Much data is available on stocks, recruitment and catches for example, but no spatial analysis is available for spawning areas or suitable fisheries sites for the project area. Within the BaltSeaPlan project, several attempts were made to close the information gap on fishing intensity and the conflicts arising between fisheries and other sea uses.

6.3.1 The remote sensing study

A remote sensing study was carried out in an attempt to fill the gap between current fisheries reporting and real use of the sea by small vessels. So far, no official information is available to determine the location, density and spatial distribution of vessels smaller than 12 m in length in the pilot area. These vessels have the potential to disturb areas important for wintering birds, but since 12 m is the threshold for reporting on the vessel's position within the EU fisheries reporting system, the intensity of pressure on these natural habitats is not known. More than 90% of the fishing vessels in the area are smaller than 12 m in length, and those vessels are not obliged to carry AIS devices on board. The study showed that it is possible to detect small boats if certain conditions are met. The method can now be translated into a planning tool for stocktaking of current sea uses in conjunction with other remote sensing tools. It is conceivable to produce pressure maps with this tool, with an even wider application to other sea regions in the long term. A second remote sensing application was also carried out to detect gill net sites, this however was less successful and can so far not be applied automatically (for more information see Rosenthal & Lehnert (2011) on remote sensing).

6.3.2 The EMPAS project and managing Natura 2000 areas for fisheries

The EMPAS project (Environmentally Sound Fisheries Management in Marine Protected Areas) was undertaken by ICES between 2006 and 2008 for the Federal Agency for Nature Conservation (BfN) and the German Federal Ministry of Environment, Nature Protection and Nuclear Safety (BMU). The main aim of the project was to develop fisheries management plans for each of ten German NATURA 2000 sites. One of the focal areas was the Pomeranian Bight with the large Natura 2000 areas in the German EEZ. EMPAS evaluated to what extent fishing activities represented a significant threat to achieving the conservation objectives of the Natura 2000 sites, and what management measures would reduce these conflicts and ensure favourable conditions in these sites (http://www.ices.dk/projects/empas.asp). Published in 2010, the results gave the first indication of the intensity of fisheries use in the area and of potential mitigating measures. There, as well as in the

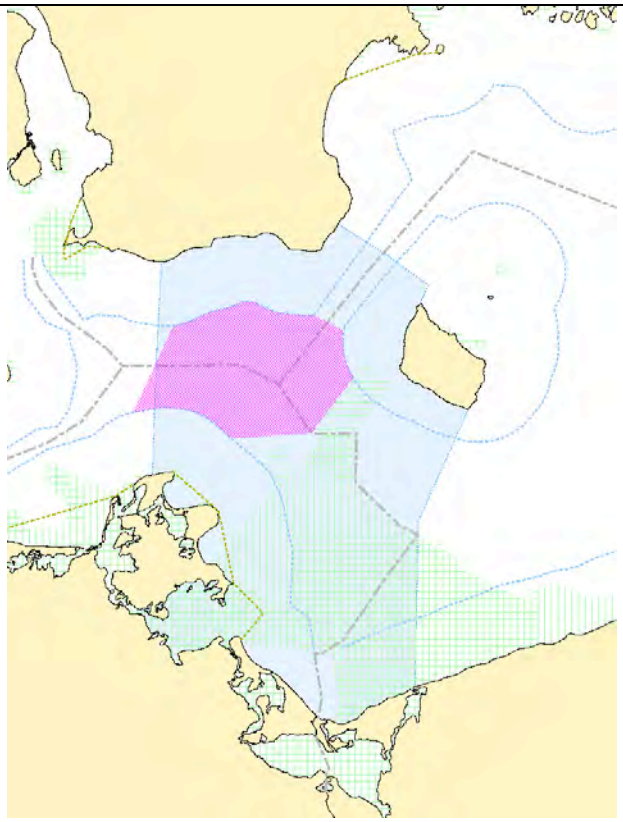
BaltSeaplan project, it became obvious that the data situation is still very poor with regard to spatial management of fisheries.

In a recent and ongoing process, the Federal Office for Nature Conservation (BfN) and the v.Thünen Institute for Sea Fisheries also developed a proposal for a set of measures for protecting Natura 2000 habitats in the German EEZ with special attention to fisheries management. The result is a number of gear-specific restrictions to fisheries in these protected areas, part of which are temporary. The joint results are currently under public discussion and will be included in the management plans for Natura 2000 such as Adlergrund, Oderbank and West Rønnebank in the Pomeranian Bight. The next step is to ask the EU Commission to incorporate the agreed measures into the respective EU fisheries management policy documents for these areas. It is the first time in Europe that such a procedure is undertaken, so this case might have pilot character for other similar processes.

The EMPAS project, the ongoing MPA management procedure involving the two German ministries and also the legal report drawn up as part of BaltSeaPlan point the way to how fisheries management can be dealt with spatially. The EMPAS Report forms part of the ecological and economic stocktake on fisheries. BaltSeaPlan report No. 23 “Legal and Planning Options for integrating fisheries into MSP at the Baltic Sea” (Schmiedel & Winter 2012) takes the options currently debated by the two German ministries and develops them into suggestions for the spatial designation of different types of fisheries management areas. Integrating this into the MSP process can clarify conflicts and determine synergies prior to the planning process. These preparatory steps of stocktaking and assessment can be carried out within the spatial planning process and could lead to the designation of respective areas in the maritime spatial plan.

6.3.3 Options for the spatial regulation of fishery: a preliminary report

A technical report was drawn as part of BaltSeaPlan that looked at the legal options offered under EU law for the spatial regulation of fisheries (BaltSeaPlan Report No. 23, Schmiedel & Winter 2012). The main focus was on whether it is possible to set aside marine areas for restricting fisheries temporarily or permanently for certain gear types or techniques. The report makes suggestions for specific areas where (1) fishery is to be excluded for the benefit of preserving biodiversity (e.g. by means of management plans for nature conservation areas), or (2) areas where certain fisheries are protected from competing fishing practices (e.g. to exclude sprat fisheries in habitats that hold large stocks of juvenile cod in the same area and of the same size as sprat). Apart from restrictions it also allows the identification of priority areas that protect fisheries from other claims like dredging, mineral extraction or wind farm installations. It also outlines how such regulations could be achieved and transposed. The spatial suggestions could be integrated into a maritime spatial plan, as well as fisheries internal management or nature conservation management plans.

Location: • EEZ of Sweden, Denmark and Germany (outside of Natura 2000 site network)	 **Magenta: Area of regulation proposed by BaltSeaPlan Report No. 23 , Schmiedel & Winter (2012)** **Other map features**: - Light blue background: pilot area - Green hatching: Natura 2000 site network (SPA/SAC) - Interrupted lines: baseline, 12nm zone, national border
Regulating regime: • Fisheries legislation of the EU (Regulation (EC) 2187/2005 or Regulation (EC) 2371/02)	
Regulative instrument: • Closed area (with reference to specific gear) • Temporal vertical closure (with reference to specific gear)	
Target uses to be regulated: • Industrial fisheries • Bottom trawling (seasonally)	**Comments:** Industrial fisheries should be excluded from the main cod spawning area indicated above (which is the central part of the main spawning area in the Arkona Basin west of Bornholm). This requires an according regulation in the spatial plans of Sweden, Denmark and Germany for the EEZ. Regulations to be imposed should be: • A total exclusion of the fishing on sand eel and sprat

	• A complete ban of nets with mesh sizes below 100mm • A ban of bottom trawling from February to June to protect the cod during spawning season
Categories in sectoral planning: • Closure for industrial fishing • Temporal closure for bottom trawling • Area with important assets for fish fauna diversity	**Will need to be translated into MSP categories/areas**
Transposition needs: Cod is of central importance to Baltic Sea fisheries, but also to natural community dynamics. If cod populations are severely reduced, the ecosystem is altered to an unnatural state. In Natura 2000 habitats such as reefs or sandbanks this reduction is incompatible with the conservation objectives there. Cod spawning areas in the western Baltic are of central importance for recruitment to the central Baltic cod population. 20% – 50% of the fish originate from this spawning area and not from the central Baltic itself[17]. Cod stocks in the southern Pomeranian Bay (including the numerous SACs located there) are also sustained by these spawning areas.	

Fig. 23: An example of balancing cod recruitment protection against industrial sprat fishery (from Schmiedel & Winter 2012)

6.3.4 Fisheries and MSP - using Marxan to work towards a zoning concept for fisheries in the pilot area

Extensive specific data are constantly gathered for selected fisheries management issues. These, however, are not commonly translated into suitability maps that show the most valuable areas for fish spawning, recruitment and catches and which also take into account the limitations that are set by competing sea uses and functions. Within BaltSeaPlan, the tool "Marxan with Zones" was applied in a first attempt at producing such suitability maps (see BaltSeaPlan report 30, Schmiedel & Lamp 2012).

In principle, the Marxan tool can offer an interim assessment of the value of a certain area for a certain type of fisheries. The results can be used at different stages of the MSP cycle to defend the fisheries case against other spatial claims for the same area. The results can also form the basis for negotiating restrictions and measures that are allowed or not in a certain area.

In the study gear-specific or species-specific maps could not be produced due to lack of appropriate data, although the tool does offer such possibilities. It should be pointed out that unlike the Marxan study for offshore wind farming (BaltSeaPlan report 29, Göke 2011, see above), the results of this study became available too late to be incorporated into the planning process for the pilot area.

[17] Bleil, M & R. Oeberst (2000): Laichgebiete des Dorschs in der westlichen Ostsee; Inf. Fischwirtsch. Fischereiforsch. 47(4): 186-190

Marxan with Zones

Like Marxan, the basic purpose of Marxan with Zones is to find the most cost-efficient suggestions for suitable marine conservation areas which meet a number of ecological, social and economic objectives. Marxan with Zones is able to allocate sites to multiple zones which have different levels of protection and can handle several costs or suitability layers independently (Ardron et al., 2010), so that several activities or uses and conservation targets can be managed. The disadvantage is that the approach is much more complex than Marxan and requires deep expert knowledge.

Like in Marxan, the study area is divided into Planning Units (PU), typically a raster of hexagons with the same boundary length between all neighbouring PUs. Costs and availability of the target features are assigned to the PUs. Restrictions can be set for each PU.

Marxan with Zones allows for the combination of different target values, which in this case were:

- Fisheries target values: areas with high fishing success or abundance of commercial fish
- Parameters that limit suitability for fisheries, including geographical parameters (distance from port) and biogeographical parameters (habitat diversity, salinity, existence of spawning sediments etc.)
- Biological values that conflict with suitability of fisheries (e.g. protected habitats and species, bird or mammal abundances)
- Competing sea uses (e.g. existing shipping lanes, wind farms, sediment extraction).

The outcome of Marxan with Zones are different scenarios, allowing planners to visualize different planning priorities and options. The tool also makes it possible to set various targets in specific zones, e.g. setting targets for different types of fishery.

Target features and data constraints for different fishing activities

In this case study good conditions for small-scale coastal fisheries were selected as a main target. This reflects the real situation in the pilot area where more than 90% of the vessels are below 10 m in length and have a limited operational range. For small-scale coastal fishery, short distance from harbour and high setnet density were taken as target features. For large fishing vessels, the corresponding target feature was high fishing success for all fisheries except for small-scale fisheries. For areas with no fishing, the target feature was High occurrence of vulnerable ecological features. Offshore wind farming was assumed to be mutually exclusive with fisheries.

Within the scope of the study it was not possible to produce a consistent dataset on the fishery activities within the pilot area. Due to data constraints, only three fishing methods, namely pelagic trawl, otter trawl (both for VMS vessels) and demersal seine were selected. Landings were grouped according to the respective fishing method. For small-scale fishery, two proxies were used: (1) setnet density, and (2) the assumption that small fishing vessels have a restricted range from harbour. For both types of fishery the information was handled separately in the single layers. Fig. 24 summarizes this information to show the modelled overall fishing intensity.

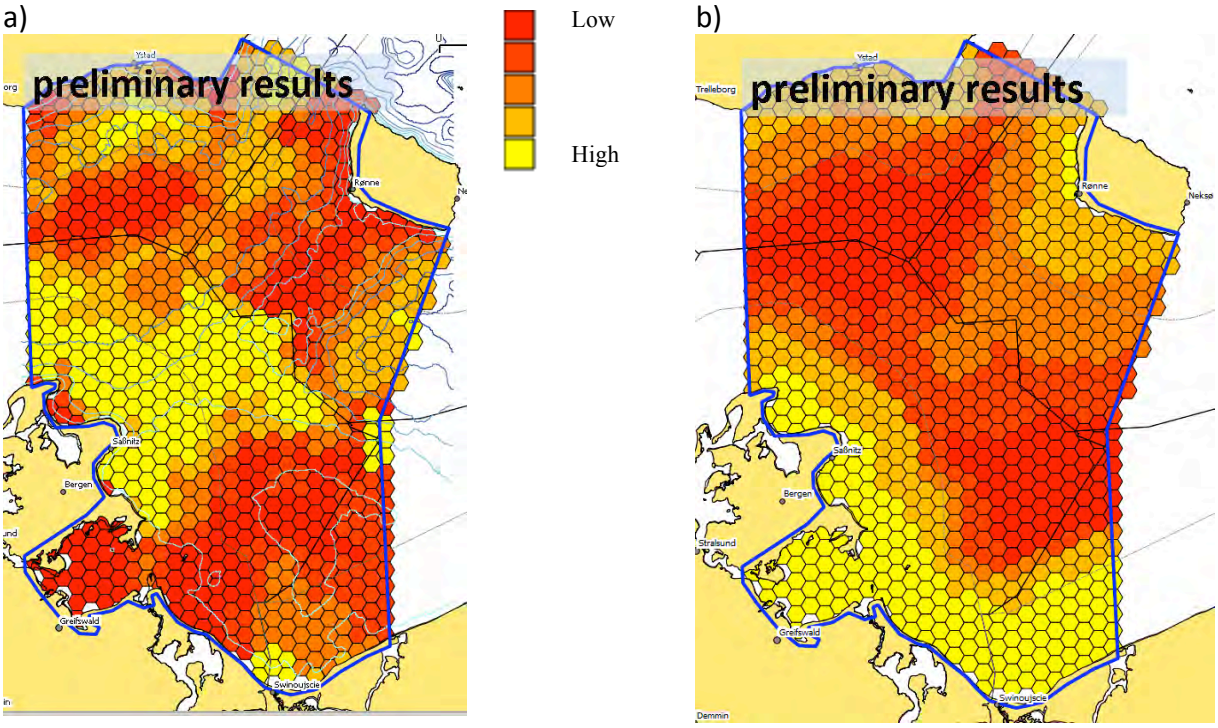


Fig. 24: Fishing intensity (a, left) reported to VMS system composed from national data sources with differing parameters, (b, right) modelled small-scale fisheries based on observed setnets in Germany and distance to harbours. ***All maps contain test data and do not reflect the exact situation.***

Cost layers

Due to lack of suitable data, the costs layers had to be constructed on an unreliable basis. To illustrate the conflicting ecological data, three types of data were used. The best available data was the abundance of diving birds for Germany (German Seabirds at Sea database). Bird abundance for the remaining area was modelled for all species together as a function of depth and distance to coast. For the spawning areas of cod (Bleil & Oeberst 2007) and herring and the nursery areas of cod (data from Nord Stream and HELCOM) only rough outlines are documented, so that a constant was used, meaning that the complete area contributes with the same intensity to the cost layer. Where no information on the occurrence of species was available, protected sites were used, with variable values depending on the relevant protection targets. Layers were aggregated for birds, fish, harbour porpoise and habitats) (not shown here, see BaltSeaPlan report 30, Schmiedel & Lamp 2012).

A range of scenarios

A basic scenario was drawn up to see what fishery restrictions would look like based only on the actual fishery activity and ecological features as costs. This was compared to a near-identical scenario which blocked out 5.8 % of the area for offshore wind farms (no fishing allowed there) and had a target of allowing fishing in 70% of the pilot project area. Compared to the basic scenario, the costs of establishing suitable fishery zones were significantly higher in this second scenario (meant here not as additional costs of fishing activities but as increasing conflicts with ecological features).

Other scenarios were developed based on different conservation targets (e.g. meeting conservation targets in 30% of the pilot project area, with and without wind farming as an added constraint) and targets for areas where no fishing takes place. A scenario was also developed where conservation targets are restricted to Natura 2000 areas.

For the map shown in Fig. 24, the target was to allow fisheries in 80% of the area and to meet nature conservation targets in 40% of the area. The map shows that the green areas are best suited to being prioritized for small scale fisheries. Dark green areas are best suited for small fisheries with some restrictions, and blue areas best suited for all fisheries. Due to nature conservation values, or because of their function as spawning areas, the turquoise parts were selected as no-take areas. In the violet areas fisheries is possible with restrictions. The white areas indicate mainly wind energy areas where fisheries are currently excluded.

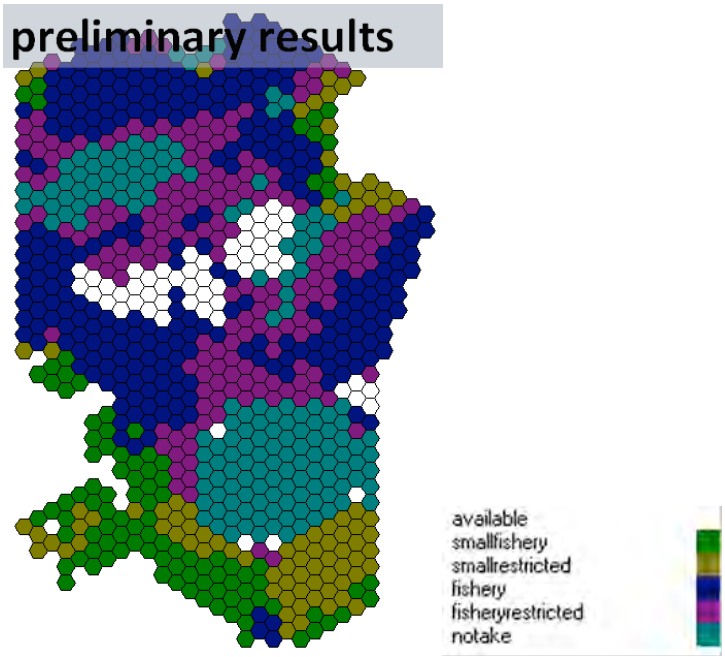


Fig. 24: Example of a modelled zoning proposal for suitable fisheries areas gained with the Marxan with Zones model. ***All model results based on test data*** *(see BaltSeaPlan report 30, Schmiedel & Lamp 2012 for further details)*

Data constraints as the main restriction

The setup of Marxan with Zones is much more complex than Marxan, but also offers options for more detailed management of an area. In order to handle the area, it is helpful to start with a reduced set of layers and check the effect of changes.

Detailed management options are available through the option of setting how much a zone contributes to a target, or the option for setting a target for each species within each zone. With more detailed data on the fishery success and even the profit for the different fisheries, the analysis could be extended to find the most profitable fishery regions.

During the development of the study, it became clear that data scarcity was the main constraint for using the tool Marxan with Zones. The modelling results can therefore only be used to illustrate the options of Marxan with Zones and point out existing data gaps. Fisheries data are only available in highly varying quality. For ecological data and the definition of potential conflicts the database was also very restricted.

In addition to the need to improve the input data, it would be essential to involve planning agencies, scientists and stakeholders to refine the definition of conflicts and targets. Typical questions that occurred during the study were:

- Do we want to strengthen small-scale fisheries?
- What sizes of no-take areas have the desired effect?

- What sizes of no-take areas can we afford if we also want to have fishery options close to harbour?
- Is it possible to combine offshore wind farming sites and no-take areas?
- How do the single features contribute or conflict with a target or within the single zones?

Overall, Marxan with Zones is shown as a useful tool to apply to fisheries, albeit with more intensive data preparation and better integration into a planning group.

6.4 An example for reconciling Natura 2000 areas and offshore wind farming

In October 2010, the EU Commission published its "Guidelines to reconcile wind energy development and biodiversity policy". Referring to the Natura 2000 network, these guidelines do not alter the existing legal provisions or policies and are not of a binding nature. The core message is that wind energy development is not per se precluded in Natura 2000 areas, but that the EU relies on the individual assessment of such projects in each specific case. Maritime spatial planning is identified as a tool for the sustainable development of seas and coasts and accorded significance in the context of avoiding conflicts that might arise from offshore wind energy projects in Natura 2000 areas. Possibly due to the topic of the guidelines, strategic planning does not appear to be regarded as an integrated and cross-disciplinary approach (page 48), but seems strongly focused on a nature conservation perspective. Nevertheless, section 4.3 "Determining suitable locations for wind farm development" can be supported from a spatial planning point of view. Beyond this, some interesting, although questionable maps are presented, as well as statements concerning the impact on the overall wind energy potential if all Natura 2000 areas were excluded from development.

In practice, this would require considerable data input and information, which was why this approach was outside the scope of the pilot planning exercise. Nevertheless, it is a useful future consideration for offshore wind farm planning.

6.5 Resolving conflicts between shipping and bird conservation

The Pomeranian Bight is one of the most important areas in the Baltic Sea for wintering and resting sea birds. Since the early 2000s the German Federal Agency for Nature Conservation has undertaken many studies on the distribution and behaviour of the different sea bird species in this area. This has resulted in an SPA and three SACs in this area (Oderbank, Adlergrund, Western Rønnebank). Two applications for offshore wind farms in the same area were turned down by BSH because of severe negative impacts on protected duck species.

During the search for suitable areas for offshore wind farms and the application procedure for Natura 2000 status, intensive flight surveys were undertaken to locate birds during different seasons. Not only feeding migration behaviour, but also the escape distance in case of disturbance was assessed. Flight distances differ according to species, with divers, velvet scoter and black scoter showing long flight distances and others like the long tailed duck shorter flight distances.

The University of Kiel studied bird responses to approaching vessels. Birds showed remarkable avoidance of areas near shipping routes especially in some time periods. Bird air survey results were overlaid with the main shipping routes and AIS tracks, which is a good method for identifying conflicts between shipping and bird habitats. However, samples were not systematically collected so that better monitoring would be advisable. As there is no compulsory reporting for smaller vessels

(shipping vessels smaller than 12m or leisure boats) via VMS or AIS , WWF conducted the Study on remote sensing for small vessels as a potential tool for tracking small vessels in remote areas.

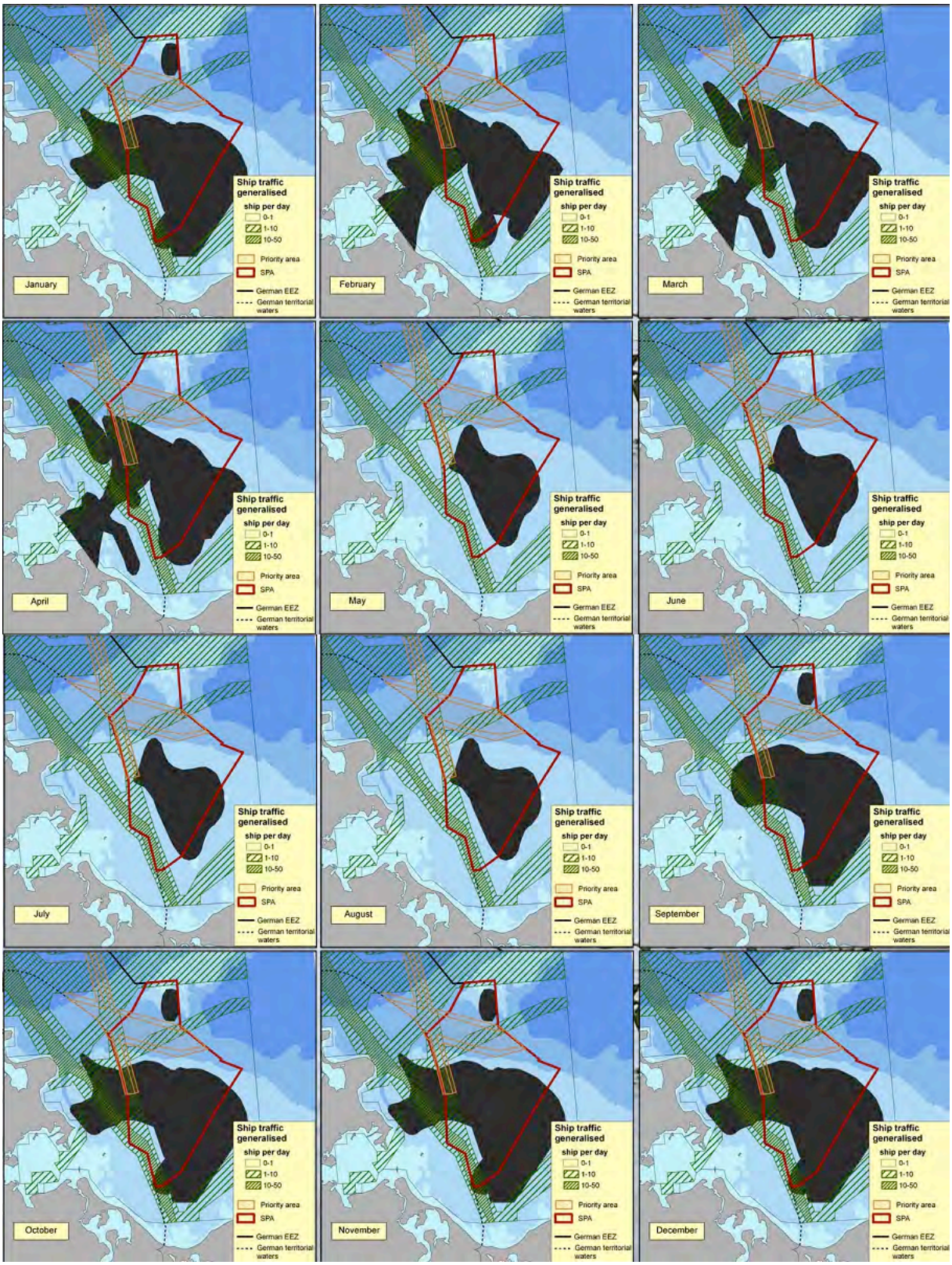


Fig. 25: Concentration areas of seabirds sensitive to disturbance by ships. Information taken from Mendel, Bettina, P.Schwemmer and S.Garthe, FTZ Büsum/BFN , Fluchtdistanzen und Verteilung von Seevögeln in Bezug zum Schiffsverkehr , presentation at a conference organized by BUND, Rostock May 2010

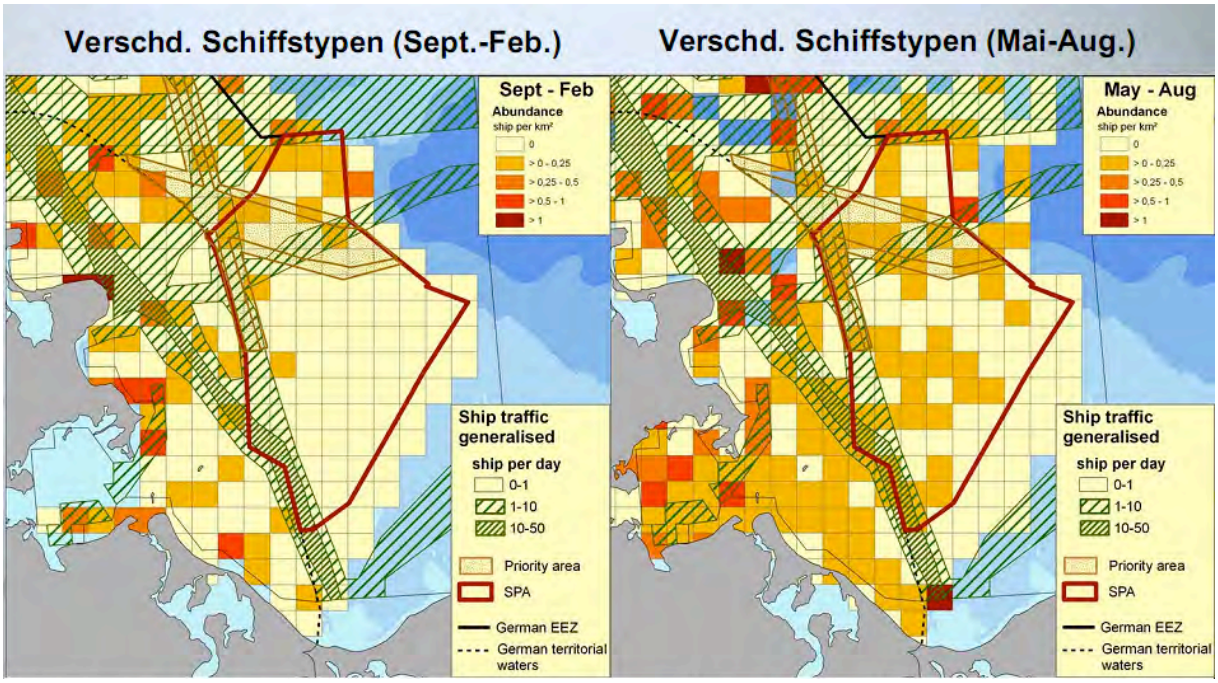


Fig. 26: Distribution of various ship types in the Pomeranian Bight based on aerial survey (Garthe, FTZ, University of Kiel) A slight redirection of the main shipping route westward and concentration of traffic routes and regulations for the sensitive seasons for sea birds might resolve the conflict. Source: Mendel, Bettina, P.Schwemmer and S.Garthe, FTZ Büsum/BFN , Fluchtdistanzen und Verteilung von Seevögeln in Bezug zum Schiffsverkehr , presentation at a conference organized by BUND, Rostock May 2010

The aerial survey revealed the dimension of the conflict. A solution would be to slightly shift the shipping routes away from the core sea bird areas, at least during sensitive seasons. Bird counts also revealed that the main (commercial) shipping traffic during the sensitive period of the year hardly interferes with the bird protection requirements. Summer frequentation of the main bird areas is most probably caused by smaller boats and not by commercial shipping. For these cases (small fishing vessels and leisure boats) specific regulations would need to be found.

A joint application to IMO by Poland, Germany and Denmark for an area to be avoided as part of the PSSA Baltic could be the next logical step in resolving the conflict without a competitive disadvantage for any of the neighbouring countries.

6.6 Identifying suitable areas for offshore wind energy in MV as an example for resolving conflicts

Mecklenburg-Vorpommern has high potential for wind energy development, which is why offshore wind farming became an issue early on. Suitable areas for offshore wind farms were identified within the 12 nm zone as part of developing the LEP (Spatial Development Programme), which was transposed into law in 2005. Identifying these areas, however, was not easy. The process first gathered information on all uses and their respective restrictions in a systematic way. The next step was a process of exclusion, where those uses most incompatible with offshore wind farming were identified first. Areas where uses are incompatible with offshore wind farming were identified as protected areas, major shipping routes, and military areas, and are outlined in red in the map below.

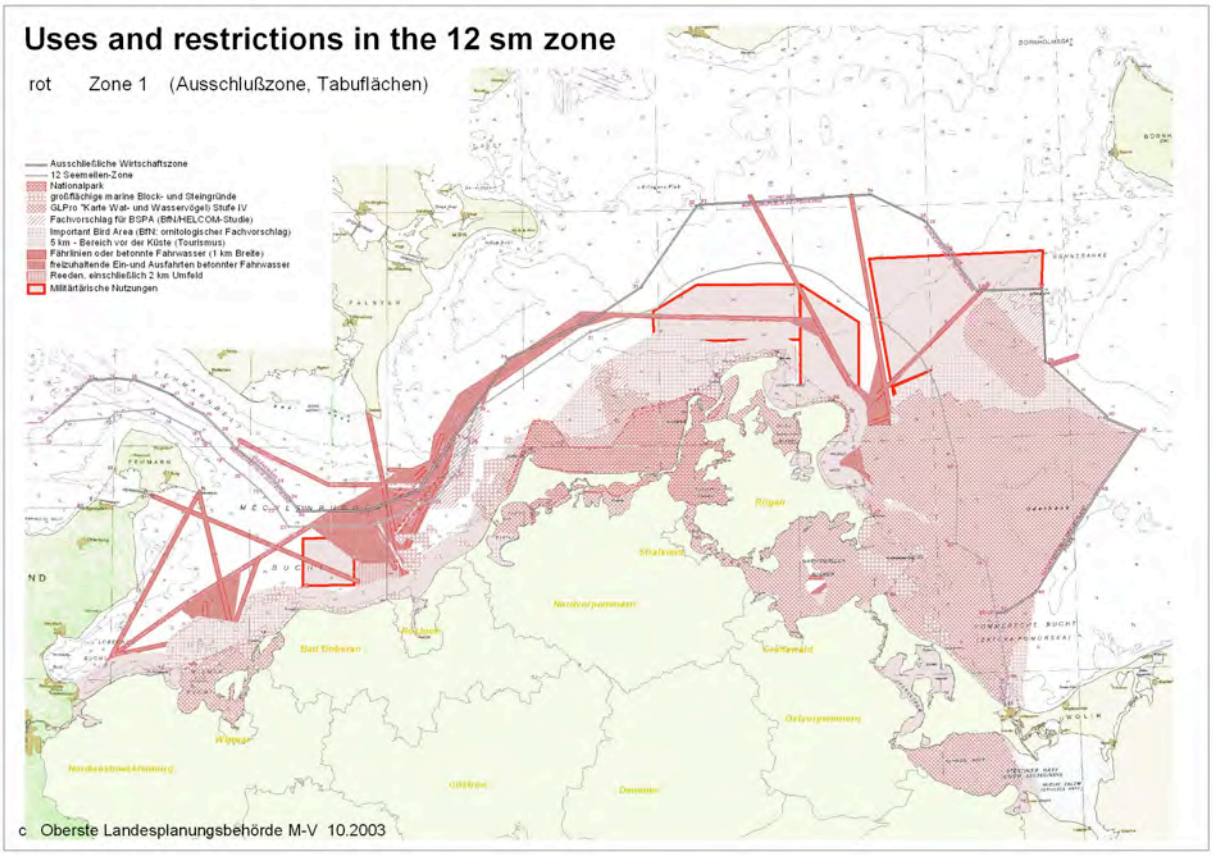


Fig. 27: Uses and restrictions in the 12 sm zone Mecklenburg-Vorpommern: Taboo areas for offshore wind farming (incompatible)(Oberste Landesplanungsbehörde Mecklenburg-Vorpommern 2003)

Areas where uses are not really compatible with offshore wind farming (extraction sites, 10 km distance from the shore due to visual impact and the importance of 'unspoilt horizon' for tourism) were identified next, outlined in green in the map below. These areas "of particular difficulty" mostly overlapped with the truly incompatible taboo (red) areas, but some new areas were also identified. This limited the available space for offshore wind farming yet again.

The third category is uses which are not really incompatible with offshore wind farms (ammunition from Second World War, main bird migration routes). This "difficult" category is marked in yellow on the third map below. Some of the yellow areas overlap with the red and green ones, but new areas become apparent too.

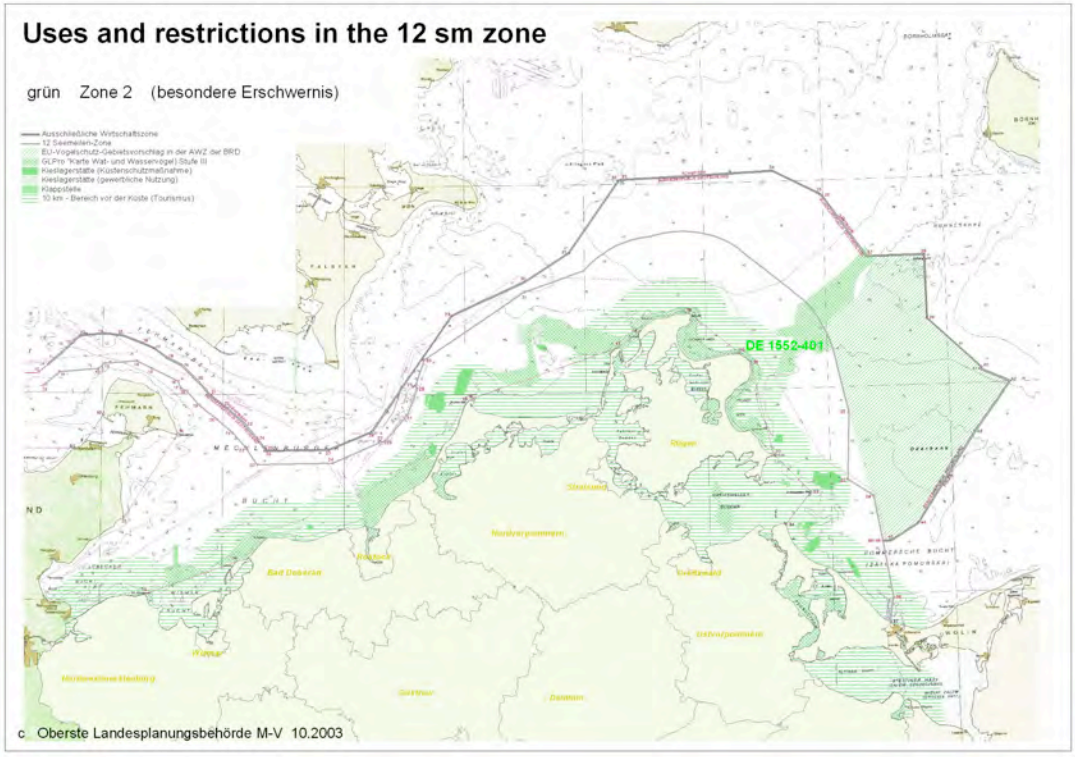


Fig. 28: Uses and restrictions in the 12 sm zone Mecklenburg-Vorpommern: Areas not really compatible with offshore wind farming ("particular difficulty") (Oberste Landesplanungsbehörde Mecklenburg-Vorpommern 2003)

In the last step, no areas could be identified where uses are entirely compatible with offshore wind farms. The overlay of the red, green and yellow categories shows how difficult the situation in the coastal waters was. Today, the situation would probably be even more difficult. In the end, two suitable areas for offshore wind farming were defined where uses are not really incompatible with offshore wind farming. Offshore wind farms cannot be built outside these suitable areas within the 12 nm zone.

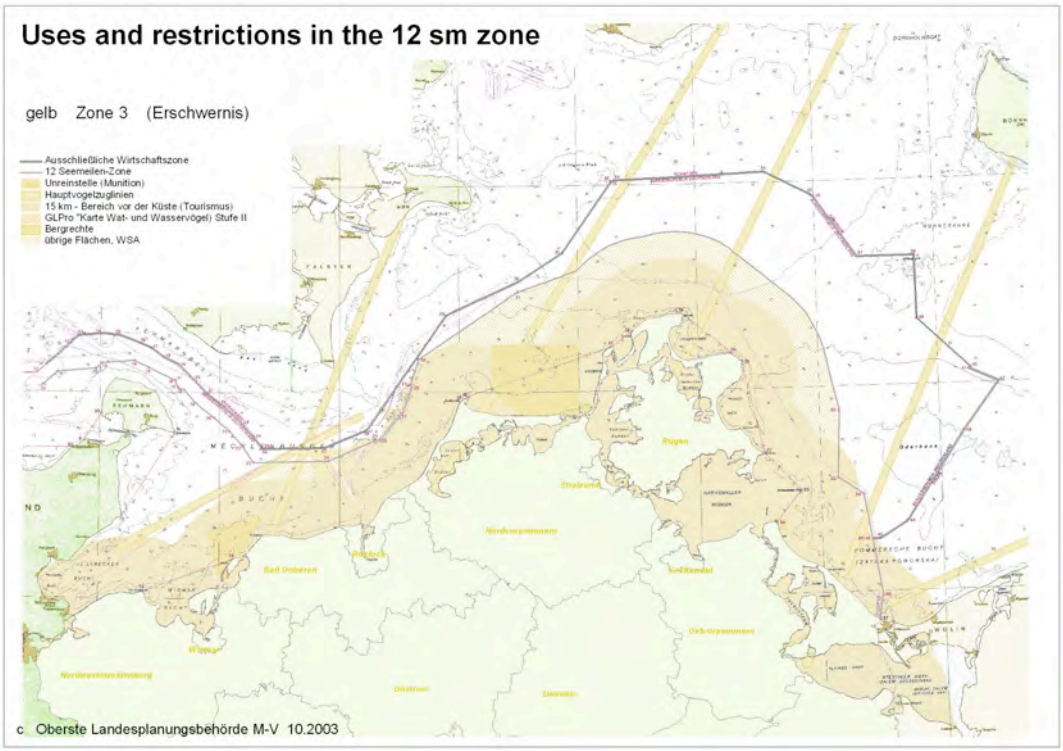


Fig. 29: Uses and restrictions in the 12 sm zone Mecklenburg-Vorpommern: Areas not entirely incompatible with offshore wind farming ("difficult") (Oberste Landesplanungsbehörde Mecklenburg-Vorpommern 2003)

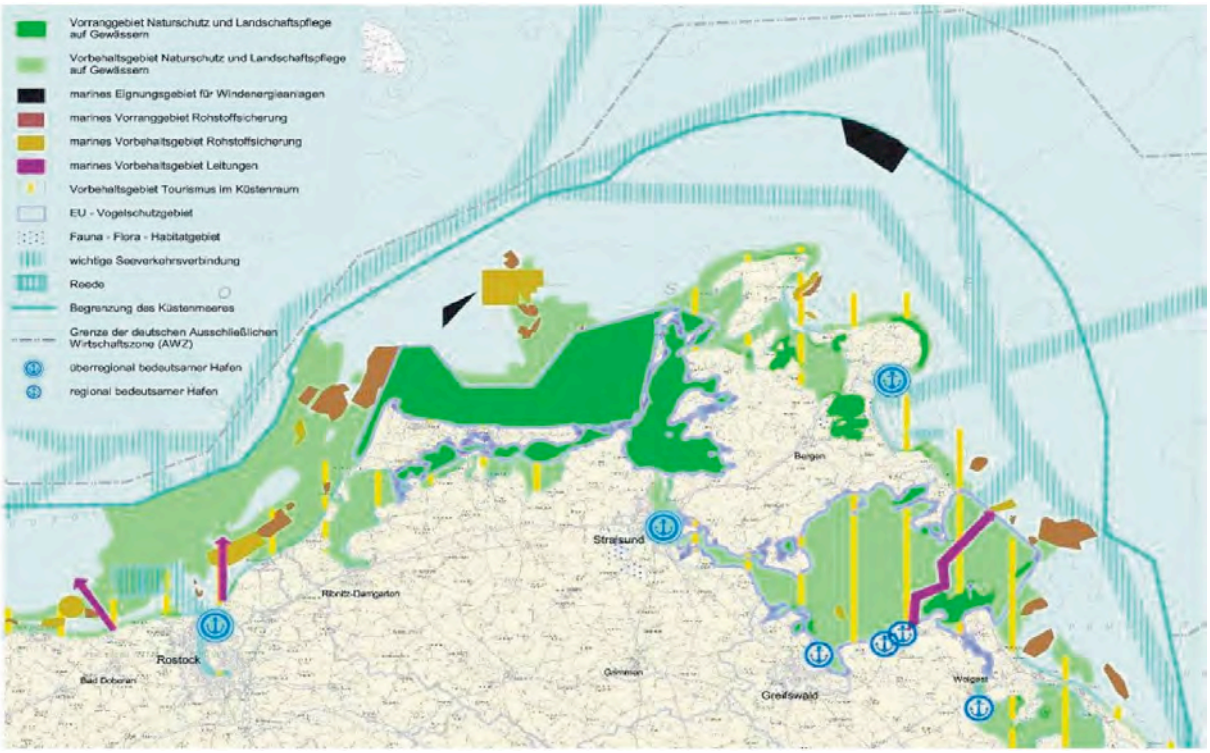


Fig. 30: Uses and restrictions in the 12 sm zone Mecklenburg-Vorpommern: Suitable areas for offshore wind (black) (Oberste Landesplanungsbehörde Mecklenburg-Vorpommern 2005)

7. The draft spatial plan

7.1 Planning principles

As stated in the introduction, the draft spatial plan presented here is the result of a planning exercise which took place outside the formal planning processes. Legally binding agreements already exist for the German EEZ and the territorial waters of Mecklenburg-Vorpommern. In addition, much data are still unavailable, and not all stakeholders could be involved in the process of drafting this spatial plan.

The draft spatial development plan is of strategic character and a tool for balancing the different interests in the use of sea space. It is based on the sustainability principle, which means balancing economic, ecological and social demands in a way that does justice to all of them. It is a future- and development-oriented plan in that it:

- identifies the various elements of the spatial system,
- identifies the interactions between the various elements, and
- indicates their desired shape.

In principle, the draft plan prioritises some sea uses in designated sea areas, ensuring the overall system of proposed solutions is coherent. The key issues tackled by the plan are the definition of problems and the development of solutions accepted by all stakeholders, ensuring both the sustainable use of marine resources and efficient utilisation of the sea area covered by the plan.

The draft plan is based on the following objectives, which were taken from national and international strategic documents (VASAB, HELCOM and Integrated Maritime Policy of the EU):

- ensuring safe and sustainable sea use;
- ensuring that spatial development is cohesive;
- ensuring the economical use of sea space;
- ensuring the good status of marine ecosystems:
- ensuring the preservation and protection of cultural heritage;
- ensuring that the international obligations resulting from ratified international agreements and from international law (including EU law) are met.

The spatial plan uses the BaltSeaPlan Vision 2030 (Gee et al. 2012) as a foundation for dealing with the four key topics of energy, cables/pipelines, nature conservation, shipping and fisheries, but also considers additional topics not specified in the vision such as tourism.

The identification of appropriate and suitable areas is a means of guiding sea-based development, and an opportunity to allocate space in an appropriate way before the planning applications are put forward.

7.2 Aims and key objectives

Although not all issues with spatial relevance could be covered in the planning exercise, the following were drawn up as specific objectives:

Shipping / Ports

- Promote safe and clean shipping, shipping transport as well as motorways of the sea (MoS)
- Reduce the collision risk in dangerous goods transport

Infrastructure / Energy

- Find suitable areas for renewable energy / wind farms
- Promote a smart (transnational) transmission grid (possibly as part of a Baltic Super Grid)
- Cable and pipeline corridors

Tourism

- Ensure favourable condition for tourism (avoid negative impact of other uses on tourism)
- Development of marinas

Protection of valuable nature conservation sites

- Protect benthic and pelagic and birds habitats and species (esp. wintering birds)
- Ensure a balanced / coherent network of Nature Protection areas (e.g. Natura 2000 and national nature reserves)
- Contribute to the good environmental status of the area by safeguarding the sea areas from negative impacts
- Identify important areas for fish spawning and nursery
- Ensure good water quality (e.g. with regard to tourism etc.)

Secure sustainable fisheries

- Promote sustainable fisheries
- Protect spawning and nursery areas from high fishery pressure (identify and value these areas)
- Identify priority areas for specific parts of the fisheries sector in the pilot area

Governance

- Promote the cooperation of authorities / government and exchange of knowledge

Monitoring

- Create an efficient transnational monitoring network

7.3 Principles of zoning

Zoning is a method of designating areas for specific purposes. It needs to be based on data from ecosystem science, on socio-economic information as well as benchmarks or critical values set for certain criteria.

In this case zoning first identifies the spatial requirements of shipping routes, offshore wind farms, linear infrastructure as well as valuable ecosystems and habitats. This is followed by the definition of buffer zones for linear activities and infrastructure (such as shipping, pipelines and cables) and non-linear structures such as offshore wind farms. Adequate designations of areas are then chosen. The draft plan attempts to designate the most appropriate areas for the specific sectors according to the area/zoning categories.

This plan makes use of the following types of areas/zones (definitions following largely those of the BaltSeaPlan Vision 2030):

Priority areas: no use is allowed that would significantly constrain the use that is given priority in this area.

Reservation areas: a certain use is given special weight in the process of balancing the competing interests in the area. The difference to priority areas is that it is not certain that the use receiving specific attention has absolute priority.

Suitable areas: an activity is exclusively assigned to respective suitable areas which have been chosen along a range of parameters – outside of these areas the activity is not allowed and not licensable.

Open use areas: no use has priority and all uses other than those restricted to suitable areas are allowed.

A maritime spatial plan is no substitute for any necessary approval or licensing procedures. Concrete projects and activities need to be subjected to environmental impact and risk assessments, which under specific circumstances may lead to projects being refused planning consent despite the fact they would generally be eligible within the respective area. Whenever decisions on a project level are taken within a priority area for this specific activity, other activities and their interest should be given consideration as far as this is possible.

Implementation of a binding maritime spatial plan requires joint action with other relevant actors. This may take the form of management plans to complement the spatial plan. Each of the subsequent chapters thus contains recommendations for management which go beyond the stipulations of the draft spatial plan. They should be understood as recommendations for the subsequent implementation of the plan.

The management proposals set out below are made on the basis of the designations of the draft spatial plan. In some sectoral planning schemes specific management plans prescribe detailed regulations for all uses in an area (e.g. in Natura 2000 areas and National Parks). A similar system of management plans could also be considered for other sectors.

As a common rule, no specific plan (management plans etc.) may be in contradiction with the overarching Maritime Spatial Plan.

7.4 Planning by sector/issue

Shipping

Under UNCLOS, shipping has a special status and enjoys freedoms guaranteed under Article 58. Therefore, the plan designates areas where shipping is given priority and may not be impeded (art. 60 para. 7 UNCLOS). In principle, shipping is also possible anywhere outside these designated areas unless other restrictions apply (e.g. for certain kinds of shipping, seasonal or temporal restrictions). Importantly, area designations do not establish new shipping routes. Only IMO would have the jurisdiction to do so.

Planning approach:

- The point of departure for establishing a system **of priority and reservation areas for shipping** is to prioritize Traffic Separation Schemes (TSS), Motorways of the Sea (MoS), as well as other main navigation routes based on an evaluation of current traffic flows. Designating priority areas for the main shipping routes outside the traffic separation schemes ensures that these areas are kept free of uses – and especially structures - that are incompatible with shipping.
- For economic and legal reasons, the main shipping routes are designated **priority areas** to the same width as the TSS. This follows the German approach in the maritime spatial plan for the EEZ. Gaps between the TSS (inside and outside the project area) are filled with straight lines. This applies to (1) the Bornholmsgat Traffic Separation Scheme with its Southern branch and its connection to the "North of Rügen" TSS (outside project area), to (2) the Bornholmsgat TSS, Northern Branch and its link with the narrower TSS off Falsterborev, and (3) to the route from the TSS West of Rønnebank to the West, with the left bend to merge with the main traffic route just west of the TSS north of Rügen.
- A **priority area** of 1 nm width has been designated for the MoS Sassnitz-Trelleborg (6).
- A **priority area** of 1 nm width has been designated for the following ferry routes as minor shipping routes: (4) Świnoujście – Ystad, (5) Świnoujście – Trelleborg, and (7) Ystad – Rønne.
- Shipping routes towards harbours in the Greifswalder Bodden and in Stralsund (8) as well as the shipping route along the Polish coast (9) have been designated as **reservation areas**.
- Safety distances alongside the shipping routes are designated as **reservation areas**, the widths of which depend on the frequency of use of the shipping route and its designation as TSS. A safety distance of 2 nm plus 500 m has been designated for route (1). For route (2) the reservation area gradually becomes narrower in line with the narrowing of the shipping route. For route (3) a general safety zone of 1 nm has been designated.
- For minor routes (Routes Sassnitz/Świnoujście -Trelleborg, Świnoujście – Ystad, Ystad - Rønne), the respective widths of the **priority areas** are 1 nm plus a 1 nm safety zone/**reservation area.**

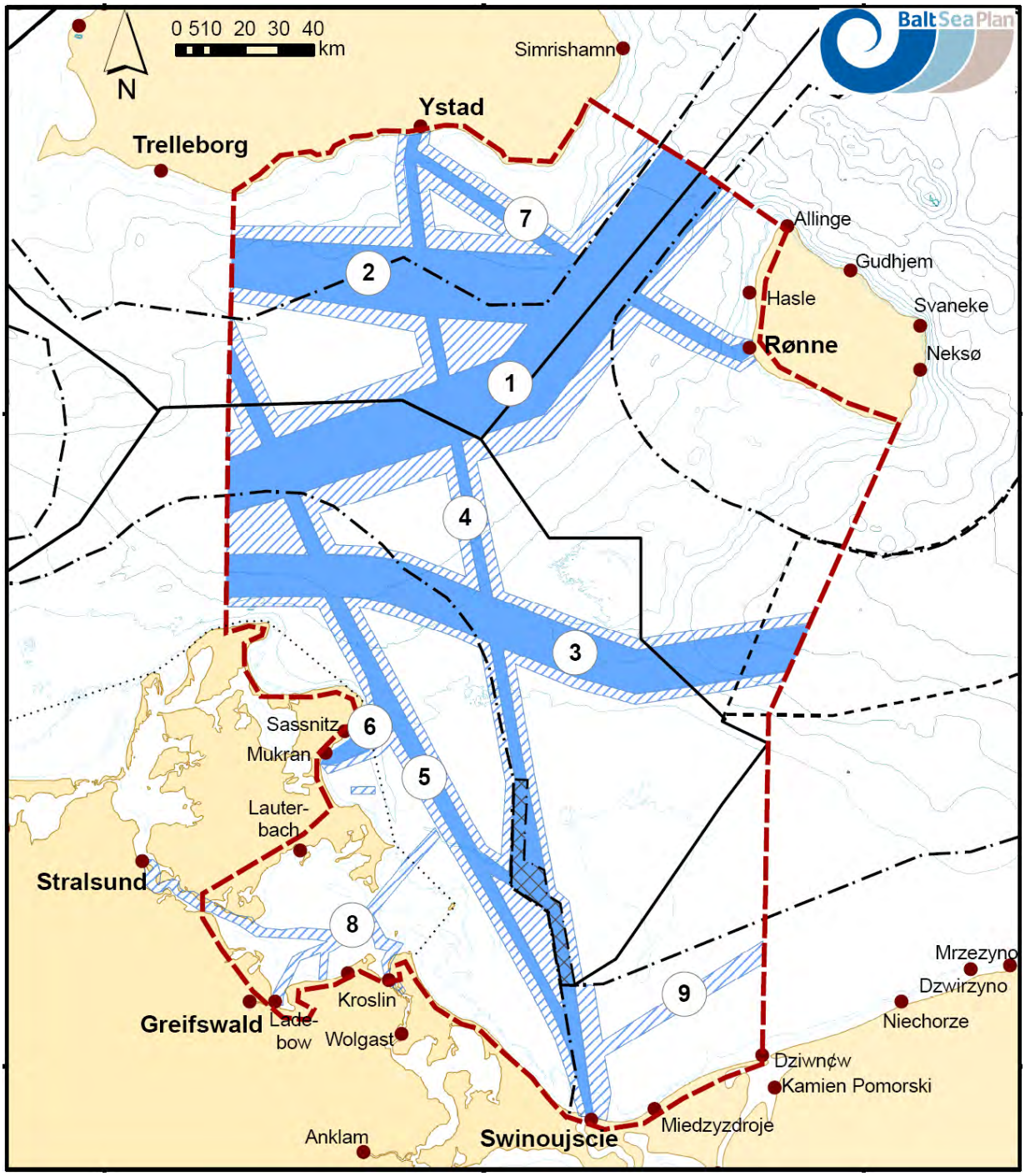


Fig. 31: Suggested priority and reservation areas for shipping

PLANNING CATEGORY	CRITERIA
Priority area In the **priority areas for shipping,** shipping is given priority over other spatially significant sea uses. Spatially significant planning measures and projects incompatible with the priority function of shipping are not permitted in these areas.	• Main shipping routes: routes along the TSS designated the width of the TSS, and the respective connecting parts, • Motorways of the Sea: width of 1 nm • Other main routes (ferry routes): width of 1 nm • Harbour approaches and roadsteads Sassnitz/Mukran, Swinousjcie and Szczecin: the width of the priority area is determined according to the harbour approaches and roadsteads
Reservation area Special consideration is given to shipping in the **reservation areas for shipping** as indicated in the map. This needs to be taken into account in the process of comparative evaluation of other spatially significant planning tasks, measures and projects.	• Minor shipping routes in Greifswalder Bodden, along the Polish coast: 1 nm width • along the main shipping routes, a safety zone of 2 nm plus 500 m • along minor routes, a safety zone of 1 nm

Further management recommendations:

> "Areas to be avoided" by maritime traffic (including leisure boats) (application at IMO) include valuable natural habitats and birds areas; this might affect the Odra Bank and/or Rønne Bank. In case of leisure boats, voluntary codes of conduct and temporary zoning could be introduced to avoid negative impacts.

> Adequate safety measures need to be established where traffic is densest and the collision risk highest. Measures should include pilot schemes, securing adequate towage capacities – to be adjusted in course of construction of offshore wind farms and increased traffic / transport of highly hazardous substances (e.g. LNG to Świnoujście, more oil transports from Russia). Emergency response schemes (collisions etc.) need to be adapted and implemented, respectively.

> The International Convention for the Prevention of Pollution from Ships of 2 November 1973, as modified by the Protocol of 17 February 1978 relating thereto (MARPOL), and the Helsinki Commission for the Protection of the Marine Environment of the Baltic Sea Area of 9 April 1992 (HELCOM), are designed to minimise pollution of the marine environment caused by shipping. Apart from IMO regulations, the "best environmental practice" according to the HELCOM Convention and the respective state-of-the-art technology should be taken into account.

> On a Pan-Baltic scale – in the context of general spatial development principles – the main shipping and ferry routes should be handled as one of the major transnational issues to be dealt with (see the BaltSeaPlan Vision 2030, Gee et al. 2012).

Issues that still need to be dealt with:

> Regulations could be needed to take account of dredging of shipping routes, particularly close to harbours and within harbour approaches and through sensitive natural habitats.

> The ferry line Sassnitz-Rønne will be affected when wind turbines are erected in the designated priority area for offshore wind energy, which partly overlaps with the existing approved area for wind farms in the German EEZ. A proposal is thus made for an alternative ferry route. A socio-economic assessment will be necessary to estimate the likely costs of such a detour.

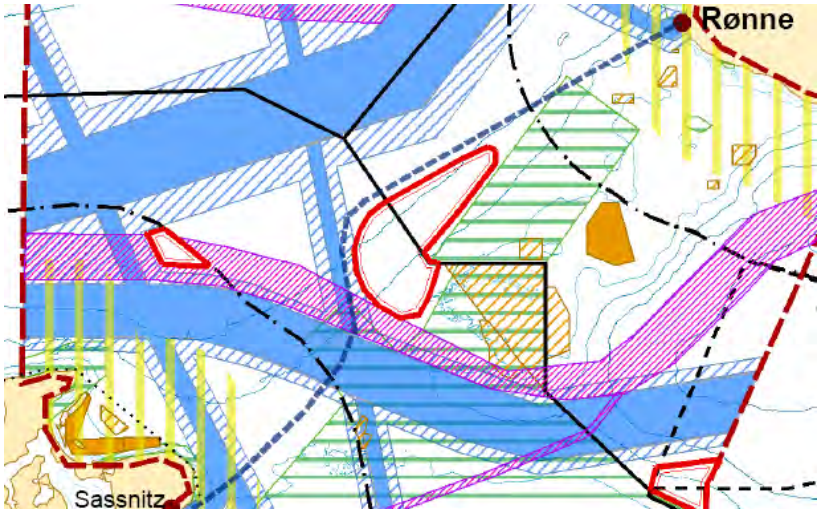


Fig. 32: Detail of draft spatial plan for Pomeranian Bight / Arkona Basin with sketch of possible new ferry route Sassnitz - Rønne

> It is unclear how shipping in general will develop in the mid- and long term, so the expected frequencies are difficult to estimate. In the future, new routes may be needed to account for an increase in traffic, Routes may also alter in response to port development. Planning would therefore benefit from comprehensive future development scenarios for shipping for the Baltic Sea – which at the moment are only available as numerical estimates but not including spatial implications such as the need for broader shipping routes, new shipping routes, new safety rules and schemes.

> It is unclear how leisure boating will develop in the mid- and long term, so the expected frequencies are difficult to estimate. There is a need to develop better knowledge on how leisure boats affect shallow coastal habitats (e.g. by their speed, frequencies, discharging toxins, etc…) and to understand how to handle increasing uses.

Offshore Wind Energy

Offshore wind energy plays an important role in the context of renewable energy targets set by countries. Allocation of space for offshore wind farming has to take account of several conflicting activities and functions, such as commercial shipping, nature conservation (sensitive habitats within or outside of Natura 2000 areas) and others.

Planning approach:

In the maritime spatial plan for the Pomeranian Bight space is allocated to offshore wind farming based on the principle of exclusion. The main priorities are safe and clean shipping, protection of valuable nature conservation sites, and ensuring favourable conditions for tourism.

This means:

- In line with the tourism-related coastal buffer zone, no offshore wind farms are permitted within the 15 km buffer zone along the coast.
- No offshore wind farms are permitted in the shipping lanes (priority areas for shipping) and their respective buffer zones (reservation areas).
- Also, offshore wind farming is not permitted within Natura 2000 areas.

Comment: *With regard to this criterion different opinions among the project partners remain. Natura 2000 areas protect a wide variety of habitats and species, and not all protected species are necessarily incompatible with offshore wind farming. There is the added difficulty that the spatial distribution of the species in question is not always precisely known. A more sophisticated approach could be to follow the EU guidance document „Wind energy developments and Natura 2000", which does not exclude this activity per se within Natura 2000 areas, but stipulates more stringent impact assessment requirements. In line with this document, we presume that these questions will need to be assessed in each individual case before a decision can be taken on the compatibility of offshore wind farming and the asset under protection.*

Since no detailed habitat maps are available yet, the plan uses Marxan results as a technical parameter to identify suitable areas for offshore wind farming within the remaining space (excluding the areas mentioned above) as well as designated areas for offshore wind farming of existing spatial plans (see chapter 6). The results obtained with Marxan coincide with the German priority areas for offshore wind farming designated in the maritime spatial plan for the EEZ; these were drawn up based on a query made to several Federal ministries.

PLANNING CATEGORY	CRITERIA
Suitable area Outside of **suitable areas for offshore wind energy** the erection of wind turbines is not permitted.	• Exclusion of a 15 km buffer zone along the coast • Exclusion of main and important shipping routes (priority / reservation areas) • Exclusion of Natura 2000 areas, or detailed assessment in each individual case to establish whether the asset under protection is affected (see comment above). • For further parameters such as wind speed, and water depth see Göke, C. (2011): "Case study: Systematic site selection for offshore wind power with Marxan in the pilot area Pomeranian Bight/Arkona Basin", BaltSeaPlan report 29.

Further management recommendations:

> Within the suitable areas, the position of the turbines, related platforms and cable connections have to be identified and approved during the course of licensing procedures. Detailed risk assessments and environmental impact assessments have to be conducted as part of the individual project approval procedures.

> Since the designated suitable areas are located very close to Natura 2000 areas and other valuable habitats outside designated nature conservation areas, pressures and disruptions caused by construction (underwater) noise, light, site traffic etc. may have strong impact on the environment and must therefore be carefully assessed. Negative impacts during the construction phase must be minimized by making use of state of the art technology and by coordinating schedules where several project construction phases coincide in time. During the operation phase maintenance traffic should also be managed in such a way that its negative impacts on the environment are minimized.

> New suitable areas should only be designated as part of the revision of the plan after having carefully monitored the impacts of the offshore wind farms within the original suitable areas, and after eligibility criteria / parameters have been adjusted respectively based on additional data and information.

> Grid connections must also be carefully sited, ensuring they have minimum negative environmental impact. They should be designed to match and connect to a future Baltic marine energy grid (see also the BaltSeaPlan Vision 2030, Gee et al. 2012).

Cables and pipelines

Planning approach:

> The draft plan accepts the existing and planned power and data cables and pipelines as a given, and accepts that not all cable connections for approved (or planned) offshore wind farms are known yet. Planned pipelines that have not yet been routed were not considered (e.g. Baltic Pipe).

> The linear infrastructure corridor as designated in the M-V Spatial plan for the Greifswalder Bodden was integrated in the plan as a reservation area for cables and pipelines (the NordStream pipeline is within this corridor).

> The NordStream pipeline (partly operating / partly still under construction in Dec. 2011) has been given the designation of "reservation area" along its route within the project area with a 500m safety buffer on either side.

> A reservation area was designated for cables along the existing multi-cable connections between the Swedish coast and Bornholm – to do justice to and secure this vital connection to the island.

> No provisions were made for existing single cables. Issues related to future cable projects have to be negotiated and weighed against other spatially relevant issues, in particular those which have been assigned priority or reservation areas.

> For cables transporting energy generated within the pilot area compulsory feed-in points into the electricity grid on land have been assigned where already known. No provisions have been made yet for power generated in potential Danish wind farms near Bornholm.

> Beyond the designated reservation areas, some general spatial recommendations are made for the location of transit corridors for cables and pipelines, as well as general corridors for linear infrastructure as part of a potential Pan-Baltic Sea Network. These corridors could enhance coordination and reduce conflicts in the planning and laying of cables and pipelines and would represent the backbone of a future Baltic Sea Energy/Electricity Grid. The pilot area only represents a very small part of the Baltic Sea and is not the appropriate scale for addressing these issues; such corridors would need to be discussed and identified at a pan-Baltic scale (see the BaltSeaPlan Vision 2030, Gee et al. 2012). As far as possible, such corridors could be handled as reservation areas for linear infrastructure.

PLANNING CATEGORY	CRITERIA
Joint reservation area cables and pipelines Special consideration is given to the laying, operation and maintenance of cables and pipelines in the **joint reservation areas for cables and pipelines.**	• existing pipeline with a 500 m buffer to either side • existing cable connections between Sweden and Bornholm: width of corridor up to 2.5 km (defined by route of outermost cables) plus a 500 m buffer on either side • overlapping reservation area for pipelines and cables in the Greifswalder Bodden area

Further management recommendations:

> If they cannot run in parallel to existing structures, pipelines and other submarine cables should cross priority areas for shipping by the shortest route possible.

> When routeing pipelines and submarine cables, consideration should be given to existing uses and rights of use, protected area designations and the interests of fisheries. Wherever possible, submarine cables should be laid in parallel using existing corridors, or routed in parallel to existing structures and facilities. Submarine cables should not cross other existing or planned pipelines or submarine cables if this can be avoided. When routing new pipelines and submarine cables, an appropriate distance from existing cables and pipelines is to be maintained.

> To minimise any potential negative impacts on the marine environment during construction, sensitive habitats should not be crossed when particular species are particularly vulnerable. Any damage to or destruction of particularly sensitive habitats such as sandbanks, reefs, and benthic communities of conservation concern, is to be avoided both during the construction and operation of pipelines and submarine cables.

> The transport of energy generated in the pilot area to suitable landing points or/and a future Baltic Sea Energy Grid is to be ensured.

Issues that still need to be dealt with:

A more comprehensive plan with regard to cables and pipelines requires further information than what is available at present.

> This applies to the prospective route for the Baltic Pipe – it could not be considered since there is no official route as yet.

> Likewise, more information would be needed to include provisions (and designate areas) for a prospective Baltic Supergrid.

> Specific information on the location of planned Danish offshore wind farms and potential cable connections is also missing.

Tourism

An important development aim for the pilot region is to strengthen tourism-related functions of coastal and marine space including leisure boating and small marinas. Thus, any activities within this coastal zone should not unduly impact on existing and planned tourism infrastructure, or detract from the attractiveness of assets such as beaches, nature reserves etc. through pollution, noise, visual impact etc.

Planning approach:

At the scale of the pilot project, the spatial planning objective is to secure a free horizon from coastal viewpoints – taking account of the high significance of visual amenity for tourism:

> For the pilot area, a simple solution has been chosen, which is to apply a fixed 15 km buffer zone around the coast within which no fixed installations such as offshore wind turbines and platforms are permitted.

> M-V is presently considering a new approach for their revised spatial development programme, which would designate a “reserve area offshore for tourism” based on a “theoretical visibility

range" which takes account of the elevation of the viewer on the coast. This designation would depend on coastline morphology, assuming "best weather" conditions.

> In DK, a 100 m limited hub height of turbines applies, which would correspond to a buffer area of ca. 19 km from the coast.

PLANNING CATEGORY	CRITERIA
Reservation area Within **reservation areas for tourism,** tourism interests are ascribed special weight. This is to be taken into account when considering other spatially relevant projects.	• Fixed 15 km buffer zone along the coastal zones

Further guiding principles and management recommendations:

> Tourism facilities and activities offered on sea as well as on land should be pooled and cross-linked, so as to make the coastal area as a whole accessible and attractive.

> All facilities should avoid marine areas that are highly sensitive ecologically.

> Expansion and redevelopment of existing facilities have priority over the construction of new facilities.

> Individual as well as group activities should avoid any damage to marine habitats and disturbance of sensitive marine life.

> Permanent or temporal / seasonal closure within assigned areas should be applied to activities such as sport fishing, leisure boating and sailing.

Issues that still need to be dealt with:

Little information is available on sailing or leisure boating in sensitive areas. More information is needed on measures taken for mitigating the impact of these activities on the environment (if applicable) in the coastal areas of Poland, Denmark and Sweden. In Germany, leisure boating and angling is covered by voluntary agreements and temporary zoning in some coastal areas, e.g. in the Greifswalder Bodden in conjunction with nature conservation law (in national parks and biosphere reserves).

Sand and gravel and other marine raw materials

Planning approach:

> In line with the idea to use the sea sparingly, which is set out in the BaltSeaPlan Vision, sand and gravel should only be extracted from marine deposits where evidence has been provided that land-based deposits cannot not deliver the necessary quality or quantity of the aggregate.

> The plan includes information on existing areas relevant for sand and gravel extraction only. No further provisions are made for additional potential deposits or new areas.

> Designated areas where sand and gravel are extracted for emergency measures of coastal defence have been assigned priority status.

> Future designation of sand and gravel extraction will need to deal with the potentially serious conflicts with environmental objectives – e.g. with regard to sandbanks and reefs within and outside of protected areas.

PLANNING CATEGORY	CRITERIA
Priority areas In **priority areas for marine raw materials** priority is given to the protection of mineral deposits required for urgent (emergency) coastal and flood defence. Any spatially relevant projects or measures in these areas incompatible with the function of the priority area to secure raw materials are excluded.	• extraction for emergency demand in coastal defence
Reservation areas In **reservation areas for marine raw materials** resource extraction is given special weight against other spatially relevant activities and functions.	• The condition is there are no comparable extraction areas on land in terms of quality or quantity of the respective aggregate

Recommendations for management:

> Where reservation areas overlap with other reservation areas (e.g. shipping, nature conservation, tourism, fishing), all concerns must be weighed and assessed on a par. Other activities and functions need to be taken into account in a suitable manner.

> Where sand and gravel priority areas coincide with Natura 2000 areas, approval decisions should follow the recommendations of the EU Guidance Document on "Non-energy mineral extraction and Natura 2000".

Nature conservation

Nature conservation plays an important role in the sustainable planning of the Pomeranian Bight pilot area. A healthy marine environment is a value in its self and a prerequisite for many uses, such as tourism and fishing (see BaltSeaPlan Vision 2030, Gee et al. 2012). At the same time, spatial planning is hampered by a lack of detailed ecological and habitat information. It is important for example to ensure connectivity between nature conservation areas and to consider the extent, values and management of individual sites within a network of protected areas. More ecological knowledge is needed to secure blue corridors to maintain connections between protected areas, which ensure the movement of organisms and the exchange of ecological processes.

Planning approach:

> Due to the lack of detailed habitat information, and due to the unfinished process of drawing up management plans, a simplified approach is chosen for Natura 2000 areas and other designated conservation areas which treats all such areas as reservation areas for the time being. When further information becomes available, or as soon as core zones have been designated in the management plans, the status of these areas of particular conservation significance can be changed to priority areas.

> Sea areas of National Parks are given priority area status.

> All spatially relevant information needs to be assessed with respect to potential conflicts between shipping and fisheries on the one hand and birds and mammals on the other, in particular along the priority shipping route through Adlergrund which is an important bird protected area.

PLANNING CATEGORY	CRITERIA
Priority area Within **priority areas for nature conservation** nature conservation objectives have priority over other spatially relevant interests in cases of conflict. Uses and projects which are incompatible with nature conservation objectives are therefore excluded.	• National parks • Future core zones of nature reserves identified in a management plan
Reservation area Within **reservation areas for nature conservation** special weight is given to natural functions and nature conservation objectives against other spatially relevant plans and activities.	• Natura 2000 areas

Recommendations for management:

> Management plans should be drawn up for Natura 2000 areas, National Parks and other designated nature reserves to secure their respective protection goals. Core zones with particular significance for nature conservation objectives should be identified and measures defined to regulate human uses in these. As soon as core zones have been identified, they can be used as a criterion for designating priority areas.

> Management plans are particularly important to secure sustainable fishery. Where important spawning and nursery grounds for fisheries fall within designated nature conservation areas, management plans for these areas should treat these as core areas.

> Management plans should be compatible with the spatial plan, in that they specify zoning and specific regulations for certain uses in order to avoid conflicts with other spatial claims. It is possible to designate certain areas as areas to be avoided under the IMO regime of PSSA. There can also be specific regulations with respect to fisheries. A list of permitted/prohibited activities

should be drawn up for each Natura 2000 area (management plans) (see common rule, box section 7.3)

> It is recommended to reduce noise pollution by limiting maximum vessel speed at specific times. Noise regulations can also be taken to fulfil the requirements of the MSFD (descriptor 11).

> Boating regulations should be introduced for leisure boats on the Odra Bank stipulating maximum speeds for vessels, because of the importance as a bird resting area.

Fishery

Even though fishery is one of the most traditional sea uses, and although it makes use of virtually all sea areas, this sector has so far not been included in the system of Maritime Spatial Planning. The international Law of the Sea (UNCLOS) has attributed many user rights to fisheries (Freedom of the Sea) and in the EU the member states have delegated many fisheries regulations to the EU common fisheries policy (CFP). In practice, and in the light of concrete decisions about sea use at specific sites, fishery becomes a highly relevant factor when competing interests are at stake. It therefore makes good sense to fully include fisheries in MSP, to the benefit of both fisheries and all other spatial interests. This is the approach taken by the BaltSeaPlan project and also the draft maritime spatial plan presented here.

Planning approach:

> "Fisheries are linked to the good environmental status of the Baltic Sea, and require concerted efforts by all Baltic Sea states to put it back on a sustainable footing" (BaltSeaPlan Vision, p.26). "Fisheries are relevant for local communities, providing economic benefits and immaterial value as Baltic Sea culture." (BaltSeaPlan Vision p. 30).

> With respect to their cultural and tourism value, and given the fact that more than 90% of the vessels in the pilot area are of small scale (below 12 m in length), planning focuses on securing preferred areas for professional coastal fisheries in order to secure the working basis and cultural values associated with this sector.

> Due to the limited availability of documented spatial data on priority interest areas for fisheries, an attempt was made to define preferred high value fisheries areas by using the decision support tool "Marxan with zones" (see preliminary results in chapter 6). This included the available VMS and AIS data from commercial fisheries reporting, as well as information on fishing ports, vessel size and their activity range from ports. Information on those sea uses that may conflict with fisheries was also included. **As the data were very scattered and not at all homogeneous, the resulting maps should be handled with great caution as they leave much room for misinterpretation** (see BaltSeaPlan report 30, Schmiedel & Lamp 2012). Still, the preliminary results were able to identify areas where fisheries are an important spatial issue and where they may deserve special attention in the process of balancing of other activities and interests.

> Due to the preliminary nature of the Marxan with Zones results, and due to the lack of reliable data, a planning category is suggested in the legend, but no areas have been designated in the draft plan.

PLANNING CATEGORY	CRITERIA
Reservation area Within **reservation areas for fisheries** special weight is given to traditional coastal fishery.	• Areas with high fisheries yield[18], used by traditional fishing vessels in a range of 10 nautical miles from the coast

Recommendations for management:

> As this is the first time for fisheries to be included in a spatial planning regime, the spatial planning measures will have to be transposed into the fisheries management regime.

> The lack of spatial data on fisheries must be overcome. Selection criteria and planning categories need to be developed to facilitate consultation with the spatial planning authorities and other stakeholders in order to arrive at a consistent system.

> The chosen site selection tool Marxan can offer decision support, although in the plan outlined here it can only help to illustrate an approach. Real suitability mapping would be required as a basis for sound planning.

> In areas where another sectoral planning regime draws up management plans (e.g. nature conservation) this regime must also integrate fisheries-related aspects. Regulations need to be drawn up in consultation with fisheries.

> A fisheries management plan should be drawn up to resolve problems occurring between different interests within the sector (e.g. conflicts between small and large-scale fisheries, between fishing for human consumption and forage fishing) and to set out the management measures taken to secure the continuous recruitment of stock (spawning and nursery areas).

Issues that still need to be dealt with:

> Spatial data and the specific requirements for those for fisheries management, still need to be defined and made available in order to secure sound planning.

> National data and international reporting data and formats need to be aligned.

> The existing reporting gap of the large majority of vessels under the 12 metre limit needs to be filled. The attempt to track fisheries activities with the help of remote sensing technologies is only one approach which needs further attention and improvement.

> Recreational fisheries are not included in this chapter and may attract more attention in the future. Again the data situation for this part of fisheries is even scarcer.

> The preliminary Marxan results need to be translated into planning categories. Decisions need to be taken on what fishery zone should be equivalent to what planning category.

[18] Concrete threshold values need to be further developed and defined based on more detailed data, using e.g. ICES landing data per quadrant as a basis

Military Exercises

Recommendations for management:

Military exercise areas coincide – and might conflict - with priority areas for shipping and nature conservation as well as with the Adlergrund suitable area for offshore wind or the priority areas for coastal tourism.

> During certain times of the year specific exercises should not be carried out within the ecologically most sensitive areas (e.g. wintering/moulting birds, etc.): details need to be specified in line with the specific projection objective.

> With regard to the predicted increase in the transport of hazardous substances on the main East-West shipping routes (crude oil from Russia) and in the southern project area (LNG to Świnoujście), increased attention needs to be given to the potential risks of military exercises.

> Future offshore installations such as wind turbines and related platforms will also have to be considered.

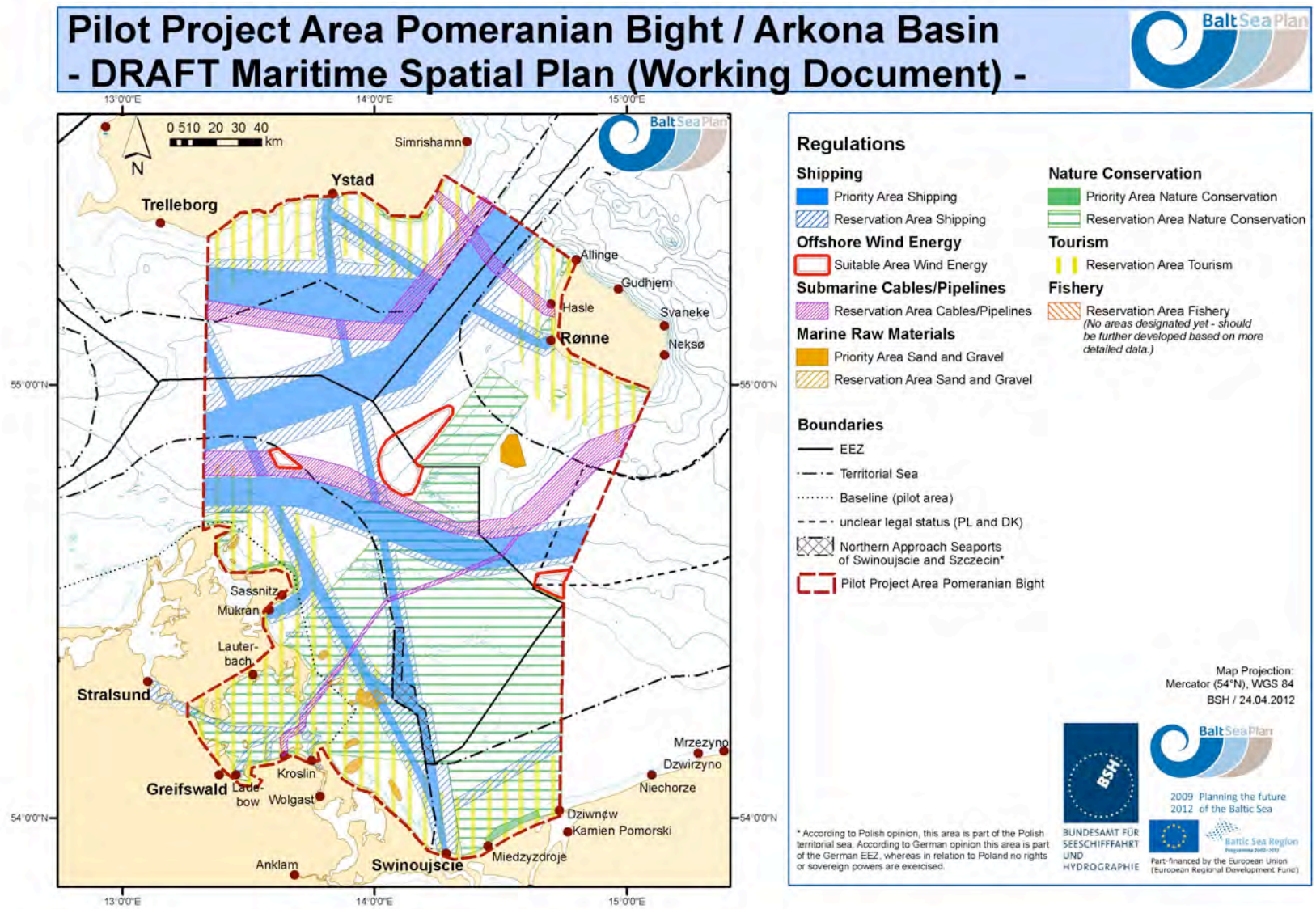


Fig. 33: The draft maritime spatial plan for the pilot area Pomeranian Bight/Arkona Basin

8. Recommendations and future steps in implementing the maritime spatial plan

Next steps

In Mecklenburg-Vorpommern, the experiences and results of the pilot project will be utilized in the revision of the spatial development programme Mecklenburg-Vorpommern. A bilateral exchange with the neighbouring region of Poland is particularly helpful on core topics such as transport and wind energy. The contacts established through the pilot project at the working level will also be helpful in the formal, official procedure.

The results and experiences of the pilot project can also be applied in the continuation of the LEP Mecklenburg-Vorpommern in terms of content. The discussions surrounding the issue of fishery have shown that this issue needs to be integrated more effectively than has been possible in the past due to problems with data. The work done in the pilot project, and by the WWF within the wider BaltSeaPlan project, can serve as a good basis for this.

The results and experiences of the transboundary drafting of the Pom Bight MSP will be taken into consideration in the future amendment of the maritime spatial plan for the German EEZ in the Baltic Sea. In this context, how to deal with designations for nature conservation purposes is of particular interest, as is the question of how to deal with designations for shipping and especially ferry routes in the light of offshore wind farm construction. Another lesson learnt is to consult the neighbouring states as soon as possible in order to discuss the development of the draft plan.

Within Germany, the pilot project has made clear that coordination is not only necessary internationally, but also nationally. With respect to the EEZ, better coordination is urgently needed between the state and federal level. This is another lesson that will be implemented directly as part of the continuation of the LEP; some of the necessary coordination has already taken place or been instigated.

In Sweden, the approach taken in this pilot exercise will need to be taken forward by the new agency responsible for MSP. This will take some time, however, and it will probably be autumn 2012 until there is a fully approved MSP Act and Ordinances. As discussions stand, this new Act will only apply to the open sea/EEZ. Coastal waters will continue to be the responsibility of local municipalities. The Swedish Environmental Research Institute hopes to support the new agency in further discussions and also hopes to develop projects on the integration of offshore and coastal MSP.

In Poland, partners have already proposed some spatial regulations for the Polish part of the pilot project area. Experiences and issues discussed within the pilot projects Pomeranian Bight and Middle Bank will be considered for future maritime spatial planning activities, as will the contacts to other planners that were established during both pilot projects.

9. Evaluation and lessons learnt

Achievements of the pilot project

This pilot project was a very challenging task as for the first time ever a maritime spatial plan was drafted for a transboundary sea area of four countries (SE, DK, PL, DE). At the beginning there was discussion on whether this draft could be a blue print for the real planning process and partly substitute official processes. For this however, the project would have needed to involve all the responsible MSP agencies in the four countries, which was not the case in the pilot project. Nevertheless, with a lot of dedication a proposal draft plan was delivered which can be taken as an input to official processes. Despite some practical problems (see below), the pilot project therefore did achieve the aims it set for itself, in particular transboundary co-operation.

Tab. 11: Achievements of the pilot project

Aims of the pilot project	**Achieved**
To develop a common understanding of the aims and practice of transboundary MSP and defining the conditions, backgrounds and needs required for cross-border coordination of MSP in the Baltic Sea Region. Specifically, to exchange experiences and broaden knowledge by drawing up a draft maritime spatial plan for a specific sea area, taking into account the national conditions and legal backgrounds for MSP	yes
Specifying the principles, problems and issues relating to the elaboration of plans, their details and scale	yes
Identifying the current and potential conflicts of interests experienced by the marine stakeholders and the interests of states in the marine areas of the four neighboring countries. Also, identifying potential spatial conflicts resulting from different ways of using marine areas and different manners of conflict resolution	yes
Developing methods of stakeholder selection and specifying the role(s) of stakeholders in the process of elaborating the plan	yes
Specifying the kind of data indispensable for drawing up the plan correctly, including the system for gathering data, the principles of data availability, the possibilities for making them accessible, and cross-border data exchange for drawing up the MSP;	mostly
Specifying the issues that require cross-border cooperation not only between the neighbouring countries, but involving all other countries of the Baltic Sea basin. This includes shipping lines, infrastructural corridors (super grid), marine environment protection / nature conservation, and renewable energy (location of offshore wind farms).	yes

An important achievement is that partners became aware of the need for permanent cross-border cooperation for MSP since marine areas do not exist in isolation. There is increased awareness of the need to create institutional forms for such cooperation, including cross-border access point to the marine environment data base which is being built with participation of all BSR countries (INSPIRE).

The most important achievement is a proposal for a draft transboundary maritime spatial plan for a whole sea basin across national borders. This includes the development of a common understanding

of the tasks involved in transboundary MSP and the objectives to be achieved (development of a common language), as well as the need for effective working and decision-making structures. Further valuable outputs include a international cooperation and data collection, the stocktake and the development of scenarios for the future use of maritime space. The particular aspect of wind farm site selection scenarios also worked out well, as did several other aspects of cross-border multi-use discussions.

An important achievement of this pilot project is that it **has made visible the benefits of MSP** at first hand. It also demonstrates the **importance of establishing and maintaining a good balance of ecologists, planners and managers in securing the sustainable planning and management of sea space**, especially in marine areas that are already heavily used such as the Baltic Sea.

The pilot project showed just how complex some problems are, not least because the area in question is shared between several countries. As a result, the pilot project had to deal with more complex problems than would have been the case if the area belonged to one country only.

The project was able to highlight the different approaches taken to MSP in the various countries, as well as differences in how problems are identified and solved. This is of major importance given the lack of experience with the MSP process and the gaps in MSP legislation.

The project has demonstrated the complexity of transnational MSP processes and the preparation of cross-border maritime spatial plans. It reveals the **need for establishing bodies or authorities with legal competences in MSP, acting in compliance with national law(s) in the respective countries. In the light of the great differences concerning the intrastate/territorial organization of MSP at least one dedicated contact person should be appointed in every region.**

What worked particularly well

- The exchange of experience between the partners in a friendly, cooperative, frank and constructive atmosphere as the basis for successful cooperation, together with the organization and manner of working on the project;
- Involving stakeholders in PL, SE and DE, although this did not always take place during the most suitable project stage;
- Establishing personal contacts between those responsible for MSP in the respective countries;
- New approaches in using modelling techniques for identifying suitable areas for certain activities;
- A thorough transboundary stocktake of the most important issues, activities and functions, with the creation of respective maps – most of this information had so far been restricted to areas within national boundaries;
- The role of the lead partner, its organizational experience, as well as the experience of partners previously involved in MSP issues (Plan Coast Project-2008, the pilot project of the spatial development plan of the western part of the Gulf of Gdańsk - 2008) allowed the less experienced partners to become effectively involved in the MSP topics.

Lessons from the stakeholder process:

- A good stakeholder map is necessary because of different communication needs.
- Ways must be found to involve missing groups of stakeholders (NGOs, ship owners).
- Separate thematic meetings for selected groups of stakeholders are a good idea, followed by a consultation meeting with all stakeholders.
- Information must be provided in the respective national language.
- Transnational consultations may be very difficult.
- Initiating a truly transnational MSP process and coherent system of plans may be difficult in the case of strong pre-existing actions or even maritime spatial plans (e.g. German EEZ)

Practical challenges experienced during the process

General/organisational:

- Underestimating the time and work involved in getting the project going. This led to a slow beginning and late focus on actual pilot project work. A straight-forward timeframe should have been set up at an early project stage;
- An unbalanced partnership, with involvement of different partners and different positions and competences with regard to MSP. There was no official planning partner from DK for example and no mandate for the participating partner; DK could not go further regarding MSP than what was already stipulated in national documents;
- Tasks were unevenly shared between partners;
- To some extent, there was unsatisfactory communication with and between the partners;
- Different comprehension of the task as such;
- Insufficient number of working meetings for elaborating the draft pilot plan. Completion of steps 6 (Finding solutions) and 7 (Drafting the plan) in particular was not satisfying; in this crucial phase more time is needed than was available here;
- Language problems;
- Different planning philosophies and therefore different approaches to identifying and addressing the planning issues to be dealt with.

The planning process:

- Lack of planning procedures and precedents, which made it difficult to define the preliminary concept and structure of the final planning document;

- Diversity of stakeholder knowledge and experience with respect to MSP and limited involvement of stakeholders at the national level (lack of legal national requirements in this regard);
- Lack of data, e.g. with regard to fisheries, habitats, shipping, and difficulties in obtaining data. Fishery was taken up relatively late in the project and not always treated on a par with the other issues. Much of the available fisheries data was not spatially relevant;
- Varying degree of MSP implementation in the respective countries, resulting also from the lack of a national legal framework.

Key lessons and recommendations for other transnational MSP processes

General

- Cross-border issues need to be tackled together and a common database established. Joint research should be carried out on issues associated with sea use and nature conservation.

Technical aspects

- Data collection and exchange should be streamlined. Right at the beginning, produce a comprehensive list of required data (scope, format, scale etc.), then keep adding to this if needed. Check the availability of this data and set up information on where data can be acquired at the right scale. It is necessary to arrange data in a hierarchy, which means to be clear about which data are indispensable and which are of minor importance for drawing up of the plan. This will have enormous impact on the whole planning process, saving costs and time. The main data required should be available during the first phase of the project so that its compatibility can be assessed and common data sets produced.
- Set up an adequate, realistic work plan with deadlines. Realistic means taking into account cultural and institutional habits, restrictions, and other possible causes for delays (e.g. summer breaks etc.)

Stakeholder involvement

- Stakeholders should be identified in a transparent and comparable manner. Each participating country should provide an overview of relevant institutions, with information on their responsibilities, interests, and their respective contact persons (stakeholder map).
- Stakeholder involvement procedures in the participating countries/regions should be conducted in a coordinated way very early on in the project. If possible similar regional events should take place during a set time period, so that results can be fed back into the transnational discussion. Subsequent events should again be scheduled in a coordinated way. In the last phase of stakeholder involvement there should be enough time, financial and staff resources (providing e.g. for interpreters needed) to have a common stakeholder event where the information obtained should be brought together and presented. Provisions should be made for a very attractive environment and set-up, and benefits for participants should be highlighted to enhance their motivation for attending.
- The diversity of available methods should be exploited to involve stakeholders in the planning process, especially those who do not take part in drawing up the plan “ex officio”.

The necessary resources (technical, time, staff etc)

- Provide for a good and competent working partnership and make sure that all can dedicate enough time to the tasks required of them. Ideally, partners would be a permanent institution to ensure continuity.
- Sufficient staff should be assigned to the project, with adequate skills, competences and responsibilities (incl. intercultural- project management, MSP processes, GIS/general IT skills, moderation skills etc.)
- Careful selection of the planning team is vital, taking account of the diversity of sectors and problems occurring in a given area.
- Sufficient time should be allocated to the project depending on its complexity. The more diverse the participating partners, and the more complex and challenging the task, the project area or the planning issues, the more complicated or problematic the search for solutions will be and the more stakeholders will need to be involved (e.g. distinguish between plans including coastal areas and those without). The time set aside for the planning process should also include the time necessary for conducting the indispensable research (e.g. sectoral studies).
- Technical equipment should be adequate to the task, and there should be staff skilled in using it (e.g. IT equipment, data centres, (compatible) GIS equipment (both hard- and software etc.)

The transnational MSP process (work as a group)

- Create an open working atmosphere, where partners e.g. do not withhold feelings of uneasiness. Everyone should feel that constructive criticism is welcomed, whether it concerns small interim working results or the process more generally.
- Agree on jointly supported project objectives, a challenging but nevertheless realistic work plan, and a jointly supported and understood project "language" as early as possible.
- Make sure that work plans are coordinated and clarify responsibilities, expectations & possibilities of the partners clearly before work begins.
- Transnational processes should be allowed distinctly longer timelines than projects set within national borders. Take enough time at the beginning of the project to jointly develop a realistic time frame.
- This time frame should schedule regular face-to-face and – if need be – video conferences to exchange information on progress and problems met, so as to be able to adjust the time frame. Face-to-face meetings should take place at least every 2 - 3 months (enough resources are needed for this!) if partners are physically far apart; if partners live closer to each other, there should be more frequent meetings. This seems extremely important since e-mail communication in a third language such as English does not seem to be an adequate substitute to meeting in person. 'Real' meetings can identify and address misunderstandings and problems much better and hopefully find solutions.
- Do not underestimate problems arising from institutional and cultural diversity, different languages and planning philosophies. Make provisions for team building at an early stage with

regard to developing a common understanding of partners' cultural and institutional differences. If partners are not very experienced in working in an international and intercultural environment, they may benefit from a dedicated intercultural project management workshop before the process starts. This helps to identify potential pitfalls and problems in communication and cooperation and to make sure that all have the same understanding of the tasks to be tackled.

> If the partnership is very large, a project steering group and – if necessary – sub-groups dealing with certain problems should be set up, each of them representative of the partners involved in the project or the specific task.

> A group should be established to continuously exchange experiences. This should consist of persons directly committed to the development of maritime spatial plans in their respective institutions. For specific issues, this group could invite experts from other institutions and stakeholder organizations to join in.

The constellation of partners

> As a minimum, the partnership should encompass all the agencies responsible for maritime spatial planning from the participating countries (on the national, and where relevant sub-national level), with additional administrative bodies, research institutions and possibly NGOs drawn in to enlarge the knowledge base – and maybe creativity - within the partnership. There could also be some associated partners.

10. References

The following were used in compiling the background information on the pilot project area, the stocktake and conflict analysis (see footnotes in the chapters for further references)

- Ålands Statistik och utredningsbyrå. http://www.asub.ax/
- Ardron, J. A., Possingham, H.P., and Klein, C.J. (eds.) (2010): Marxan Good Practices Handbook. Victoria, BC, Canada: 165 pages.
- ÅSUB (2008): Bornholm, Economic and Innovative Capacity: Dealing with Dichotomies, Rapport 2008:5
- Ball, I.R., H.P. Possingham, and M. Watts (2009): Marxan and relatives: Software for spatial conservation prioritisation. Chapter 14: Pages 185-195 in Spatial conservation prioritisation: Quantitative methods and computational tools. Eds. Moilanen, A., K.A. Wilson, and H.P. Possingham. Oxford University Press, Oxford, UK.
- Bellebaum, J. (2010): Untersuchung und Bewertung des Beifangs von Seevögeln durch die passive Meeresfischerei in der Ostsee, Schlussbericht über das F+E Vorhaben August 2010 (FK 350785090), Angermünde 2010.
- Bellebaum, J. (2011): Untersuchung und Bewertung des Beifangs von Seevögeln durch die passive Meeresfischerei ider Ostsee. Schlussbericht über das F+E-Vorhaben (FKZ 3507 85 090). BfN-Skript 295, 2011
- Bellebaum, J., Grieger, C., Klein, R., Köppen, U., Kube, J., Neumann, R., Schulz, A., Sordyl, H. & H. Wendeln (2010): Ermittlung artbezogener Erheblichkeitsschwellen von Zugvögeln für das Seegebiet der südwestlichen Ostsee bezüglich der Gefährdung des Vogelzuges im Zusammenhang mit dem Kollisionsrisiko an Windenergieanlagen. Abschlußbericht 2008, aktualisiert 2010. Forschungsvorhaben des Bundesministeriums für Umwelt, Naturschutz und Reaktorsicherheit (FKZ 0329948). Neu Broderstorf.
- Berkenhagen, J., Döring, R., Fock, H., Kloppmann, S., Pedersen, A., Schulze, T. (2010): Conflicts about spatial use between wind farms and fisheries – what is not implemented in marine spatial planning. Inf. Fischereiforsch. 57, 2010, pp 23-26
- Blei, M. & R. Oeberst (2007): Dorsche in der Ostsee, Wo und wann sie sich fortpflanzen. Bundesforschungsanstalt für Fischerei (BFA), Institut für Ostseefischerei, Forschungsreport 2/2007
- Bleil, M. & Oeberst, R. (2000): Laichgebiete des Dorschs in der westlichen Ostsee. Inf. Fischwirtsch. Fischereiforsch. 47(4): 186-190.
- Bornholms Regionskommune (2008): Visioner of det gode liv på Bornholm, Regional udviklingsplan 2008, download from http://www.regioner.dk/PolitikOgHoldninger/Regional%20udvikling/Den%20Regionale%20Udviklingsplan/~/media/migration%20folder/upload/filer/regional%20udvikling/rup/rup_brk_sep_2008.pdf.ashx
- Bornholms Regionskommune Regionplantillaeg nr. 7 for de bornholmske havne. Download from http://www.bornholmshavne.dk/index.php?option=com_content&view=article&id=47&Itemid=54
- Bundesamt für Naturschutz (BfN) (2008): Erhaltungsziele für das FFH-Gebiet „Adlergrund“ (DE 1251-301) in der deutschen AWZ der Ostsee, Januar 2008

- Bundesamt für Naturschutz (BfN) (2008): Erhaltungsziele für das FFH-Gebiet „Pommersche Bucht mit Oderbank“ (DE 1652-301) in der deutschen AWZ der Ostsee, Januar 2008
- Bundesamt für Naturschutz (BfN) (2008): Erhaltungsziele für das FFH-Gebiet „Westliche Rönnebank“ (DE 1249-301) in der deutschen AWZ der Ostsee, Januar 2008
- Bundesamt für Naturschutz (BfN) (2009): Ecologically sound and sustainable Fisheries. Recommendations of the Federal Agency for Nature Conservation, Insel Vilm, September 2009.
- Bundesamt für Naturschutz (BfN) / von Thünen-Institut (2011): Maßnahmenvorschläge für das Fischereimanagement in Natura 2000-Gebieten der deutschen AWZ der Nord- und Ostsee (Arbeitsgruppe Nord- und Ostsee), Hamburg, Rostock, Insel Vilm 20.04.2011
- Bundesamt für Seeschifffahrt und Hydrographie (BSH) (2008): Naturverhältnisse Ostsee, Teil B zu den Handbüchern für die Ostsee und das Kattegat, Hamburg u. Rostock, 2008
- Bundesamt für Schiffahrt und Hydrographie (BSH) (2009): Legal ordinances, map of the Maritime Spatial Plan for the EEZ (Baltic Sea), justification and environmental report (see non-technical summary (Baltic Sea) in English): http://www.bsh.de/en/Marine_uses/Spatial_Planning_in_the_German_EEZ/documents2/Report-BalticSea.pdf
- Bundesamt für Seeschiffahrt und Hydrographie (BSH) (2009): Spatial Plan for the German Exclusive Economic Zone in the Baltic Sea (unofficial translation), Hamburg, December 2009
- Bundesamt für Seeschifffahrt und Hydrographie (BSH) (2009): Umweltbericht zum Raumordnungsplan für die deutsche ausschließliche Wirtschaftszone (AWZ) in der Ostsee, Stand 31.10.2009, Hamburg / Rostock, October 2009
- Burchard, H. (2007): Können Windparks die Ostsee aufmischen? http://www.io-warnemuende.de/koennen-windparks-die-ostsee-aufmischen.html
- Council of the European Union (2005): Council Regulation (EC) No 2187/2005 of 21 December 2005 for the conservation of fishery resources through technical measures in the Baltic Sea, the Belts and the Sound, amending Regulation (EC) No 1434/98 and repealing Regulation (EC) No 88/89, Offical Journal of the European Union, 31.12.2005
- Council of the European Union (2005): Council Regulation (EC) No 289/2005 of 17 February 2005 amending Regulation (EC) No 88/98 as regards the extension of the trawling ban to Polish waters. Official Journal of the European Union, 22.02.2005
- Dahl, K., Göke, C., Lundsteen, S., Carstensen, J., Al-Hamdani, Z., Leth, J.O., Havesteen, C.W. (2011): Seabed and habitat mapping in the Hatter Barn area - a high risk area for shipping in the Danish straits. BaltSeaPlan Report 29, download from www.baltseaplan.eu
- Danish Energy Authority (2007): Future Offshore Wind Power Sites 2025 – The Committee for Future Offshore Wind Power Sites. ISBN: 978-87-7844-677-0
- Danske Havne (2010): Danmarks Havne, Havnepolitisk redegörelse 2010
- Deutscher Bundestag (2009): Antwort der Bundesregierung auf die Kleine Anfrage der Abgeordneten Dr. Kisten Tackmann, Paul Schäfer, Monika Knowche, weiterer Abgeordneter und der Fraktion DIE LINE – Drucksache 16/11866 - Deutscher Bundestag, 16. Wahlperiode, Drucksache 16/12083, 02.03.2009
- Ekebom, J. et al. (2008): Towards Marine Spatial Planning in the Baltic Sea. BALANCE Technical Summary Report 4, May 2008.

- Erdmann, F., Bellebaum, J., Heinicke, T. (2007): Analyse und Bewertung der Lebensraumfunktion der Landschaft für rastende und überwinternde Wat- und Wasservögel, 2007, Abschlussbericht, Dezember 2007.
- EU TENT-T Executive Agency (2009): High Quality Rail and Intermodal Nordic Corridor Königslinie, 2008-EU-21010-P, Part of Priority Project 21 (updated September 2009). Download information sheet from http://tentea.ec.europa.eu/download/MoS/fichenew_2008eu21010p_finalkb2.pdf
- European Commission (2010): Non-energy mineral extraction and Natura 2000. Guidance document, July 2010
- European Commission (2010): Wind energy developments and Natura 2000. Guidance Document, October 2010
- Förster, T. (2007): Schiffswracks in der Ostsee – Die touristische Nutzung von maritimen Denkmalen in Mecklenburg-Vorpommern, Greifswalder Beiträge zur Regional-, Freizeit- und Tourismusforschung,Bd. 17, 21 – 35
- Gajewski, J. & M. Matczak (2007) Main potentials and conflicts in the Polish sea space. East West Window Project.
- GAZ-System Regional Cooperation (Poland) (2011): Presentation at the ENTSOG TYNDP Workshop. Brussels, 17th March 2011
- Gee, K., Kannen, A., Heinrichs, B. (2011): Towards a Common Spatial Vision: Implications of the international and national policy context for Baltic Sea space and MSP. BaltSeaPlan Report 8, download from www.baltseaplan.eu.
- Gee, K., Kannen, A., Heinrichs, B. (2012): BaltSeaPlan Vision 2030 - Towards the sustainable planning of Baltic Sea. Download from www.baltseaplan.eu
- GEUS & The National Forest and Nature Agency (1998): Treasures hiding in the Sea – Marine raw material and Nature Interests, GEOLOGI – Nyt Frau GEUS, Copenhagen, December 1998
- Göke, C. (2011): Systematic site selection for offshore wind power with Marxan in the pilot area Pomeranian Bight/Arkona Basin. BaltSeaPlan Report 29, download from www.baltseaplan.eu.
- HELCOM (1999): Marine Sediment Extraction in the Baltic Sea – Status report, BSEP No 76, Helsinki 1999
- Her Udvider Havnene Danske. Erhvervshavnes Udvidelser og Planer 2010, December 2010. Download from http://www.danskehavne.dk/dk/Menu/Publikationer/Danske_havneudvidelser_2010
- Hinrichsen, H.-H., Kraus, G., Böttcher, U., Köster, F. (2009): Identifying eastern Baltic cod nursery grounds using hydrodynamic modelling: knowledge for the design of Marine Protected Areas, ICES Journal of Marine Science 66, 101–108.
- ICES (2006): Report of the Workshop on Fisheries Management in Marine Protected Areas (WKFMMPA), OCES WKFMMPA Report 2006, Copenhagen, 3.-5. April 2006
- ICES (2008): Report of the Working Group on Effects of Extraction of Marine Sediments on the marine Ecosystem (WGEXT), 8-11 April 2008, Copenhagen 2008
- ICES (2008): Report of the Workshop on Fisheries Management in Marine Protected Areas (WKFMMPA), 2.-4 June 2008 (ICES CM 2008(MHC:11), Copenhagen 2008
- ICES (2009): Report of the EMPAS project (Environmentally Sound Fishery Management in Protected Areas), 2006 – 2008, Copenhagen 2009

- ICES (2010): Integrated ecosystem assessments of seven Baltic Sea areas covering the last three decades, ICES Cooperative Research Report, No. 302, Copenhagen, June 2010
- IFAÖ (2008): FFH-Verträglichkeitsuntersuchung (FFH-VU) nach § 18 LnatG M-V, § 34 Abs. 1 BnatSchG in Verb. Mit Art. 6 (3) der FFH-Richtilinie zum Projekt Nord Stream Pipeline von der Grenze der deutschen Ausschließlichen Wirtschaftszone (AWZ) bis zum Anlandungspunkt, Dezember 2008
- IFAÖ (unpublished, 2011): Abstract regarding abundance, spawning and nursery areas of fish in the BSP Pomeranian Bight Pilto Region, citing e.g. Bleil, M., R. Oeberst, and P. Urrutia. 2009. Seasonal maturity development of Baltic cod in different spawning areas: importance of the Arkona Sea for the summer spawning stock. Journal of Applied Ichthyology 25:10-17
- IMO (2006): New and amended existing Traffic Separation Schemes, COLREG.2/Circ.57, 26.May 2006
- IMO (2010): New and amended existing Traffic Separation Schemes, COLREG.2/Circ. 61, 1. June 2010
- IMO Sub-Committee on Safety of Navigation, 52nd session (2005): Agenda item 3: Routeing of Ships, Ship Reporting and related Matters. New traffic separation schemes in Bornholmsgat and North of Rügen, recommended deep-water route in the eastern Baltic Sea, amendements to the traffic separation schmes Off Gotland Island and South of Gedser and new areas to be avoided at Hoburgs Bank and Norra Midsjöbanken, NAV 52/3/6, 3 March 2005
- IMO Sub-Committee on Safety of Navigation, 54th session (2008): Agenda item 3: Routeing of Ships, Ship Reporting and related Matters, Information about planned new routeing measures in the southern part of the Baltic Sea, NAV 54/INF.5, 4 April 2008
- IO Warnemünde: History of the Baltic Sea (website): Paleographic development of the Western Odra region. Website QuantAS project, „Arkona Sea Simulation: http://www2008.io-warnemuende.de/quantas/index.php?option=com_content&task=view&id=30&Itemid=51
- Johann Heinrich von Thünen-Institut (vTI) (2011): Fischbestand Dorsch westliche Ostsee, June 2010 – June 2011. Fischbestände online, http://fischbestaende.portal-fischerei.de
- Kurtz, R. (2007): Ships‘ Routeing and Safety of Shipping in the Baltic Sea. Presentation of the outcome of a HELCOM Working Group). http://www.offshore-wind.de/page/fileadmin/offshore/documents/Politik_und_Wind/Tourismus/2b_Kurtz.pdf
- Land Mecklenburg-Vorpommern (2009): Richtlinie für die Erteilung von Bergbauberechtigungen und zur Zulassung von Hauptbetriebsplänen für die Aufsuchung und Gewinnung von marinen Sanden im Bereich der Küstengewässer und des Festlandsockels des Landes Mecklenburg-Vorpommern für Strandaufspülungen und Küstenschutzmaßnahmen (Richtlinie marine Sandgewinnung für Küstenschutz – RL – MSP), Erlass des Wirtschaftsministeriums im Einvernehmen mit dem Ministerium für Bau, Landesentwicklung und Umwelt, vom 9. Dezember 1997, zuletzt geändert durch VV vom 06.04.2009 (Amtsbl. M-V 2009, S. 385) – über Dienstleistungsportal M-V: www.landesrecht-mv.de/
- Landesanglerverband Mecklenburg-Vorpommern (LAV) in co-operation with Landesamt für Landwirtschaft, Lebensmittelsicherheit und Fischerei Mecklenburg-Vorpommern (LAUF) and WWF Germany, Baltic Sea Office (2006): Angeln und Naturschutz in Greifswalder Bodden und Strelasund, November 2006
- MACHU (Managing Cultural Heritage Underwater) (2001): Reports 1 – 3 (Final Report): Report 2 on Cultural Heritage in the Baltic Sea States Given by the Monitoring Group, agreed upon by the Monitoring Group in Tallinn, Estonia 6-7 August 2001

- MAGALOG project (2008): Maritime Gas Fuel Logistics, Developing LNG as a clean fuel for ships in the Baltic and North Seas. Report from the MAGALOG project, December 2008.
- Marshal of the Voivodship West Pomerania (2010): Spatial Plan of the Voivodship West Pomerania, Draft. Szczecin, August 2010
- Mendel, B. et al. (2009): Determination of flight distances of seabird species occurring in the Special Protection Areas in the German EEZ, Report for the Service Contract, Büsum 2009.
- Ministerium für Arbeit, Bau und Landesentwicklung Mecklenburg-Vorpommern (2005): Landesraumentwicklungsprogramm Mecklenburg-Vorpommern, Schwerin 2005, http://www.mv-regierung.de/vm/raumordnung/aktuell_neuaufstellung_karte_CMS.html
- Mohn, C., Kotta, J., Dahl, K., Göke, Blažauskas, N., Ruskule, A., Aps, R., Fetissov, M., Janssen, F., Lindblad, C., Piotrowski, M., Wan, Z. (2011). Modelling in BaltSeaPlan: Concepts, tools, applications. BaltSeaPlan Report 19, download from www.baltseaplan.eu.
- Mortensen, L.O., Tourgaard, J., Teilnann, J. (2011) Effects of underwater noise on harbour porpoises around major shipping lanes. BaltSeaPlan Report 21, download from www.baltseaplan.eu.
- National Board of Antiquities (2008): Cultural Heritage Cooperation in the Baltic Sea States, Report 5, Helsinki, 2008
- Nordregio – Nordic Centre for Spatial Development: Several maps with regard to population, population changes, economic development in the Baltic Sea Region as available from the website: http://www.nordregio.se/Maps--Graphs/
- OffshoreGrid (2011): Offshore Electricity Infrastructure in Europe: A Techno-Economic Assessment, 3E (coordinator), dena, EWEA, ForWind, IEO, NTUA, Senergy and SINTEF, Final Report, October. Offshore Electricity Infrastructure in Europe, A Techno-Economic Assessment, Final Report, October 2011
- Pedersen, S.A. et.al. (2009): Natura 2000 sites and fisheries in German offshore waters, ICES Journal of Marine Science, 66: 155–169
- Petersen, I.K., Nielsen, R.E. (2011): Abundance and Distribution of selected Waterbird Species in Danish Marine Areas. National Environmental Research Institute (NERI) Report 2011, Aarhus University
- Polish Wind Energy Association (PWEA) (2010): Wind power development in Poland by 2020 – a vision. Report, Summary, Szczecin, January 2010
- Region Skane (2010): Regionalt utvecklingsprogram för Skåne (2009-2016), 2010
- Regionaler Planungsverband Vorpommern (2010): Regionales Raumentwicklungsprogramm Vorpommern 2010 (RREP Vorpommern), Greifswald 19.08.2010
- Rosenthal, W. and Lehner, S. (2011): Remote sensing methods for detecting small fishing vessels and fishing gear - a feasibility study in the Pomeranian Bight and Arkona Sea. BaltSeaPlan Report 22, download from www.baltseaplan.eu
- Schmiedel, J. & Lamp, J. (2012): Case Study: Site selection of fisheries areas for MSP. BaltSeaPlan report 30, download from www.baltseaplan.eu
- Schmiedel, J. & Winter, G. (2012): Legal and planning options for integrating Fisheries into Maritime Spatial Planning at the Baltic Sea. BaltSeaPlan Report 23, download from www.baltseaplan.eu

- Schultz-Zehden, A., Gee, K., Scibior, K. (2008): Handbook on Integrated Maritime Spatial Planning. Berlin, April 2008
- Sell, A., Pusch, C., von Dorrien, C., Krause, J., Schule, T., Carstensen, D. (2011) (Working group North Sea and Baltic Sea): Proposed measures for fisheries management in Natura 2000 sites in the German EEZ of the North Sea and the Baltic Sea, Hamburg, Rostock, Insel Vilm 20.04.2011
- Sordyl, H., Kube, J., Bellebaum, J. & C. Grieger (2005): Gutachtlicher Vorschlag zur Identifizierung, Abgrenzung und Beschreibung sowie vorläufigen Bewertung der zahlen- und flächenmäßig geeignetsten Gebiete zur Umsetzung der Richtlinie 79/409/EWG in den äußeren Küstengewässern Mecklenburg-Vorpommerns, Juni 2005
- Steingrube, W., Scheibe, R., Feilback, M. (2004): Ergebnisse der Bestandsaufnahme der touristischen Infrastruktur im Untersuchungsgebiet, Institut für Geographie und Geologie Universität Greifswald, IKZM-Oder Berichte 4 (2004), Greifswald 2004
- Szyszka, G. & S. Krzyzaniak (2008): Logistics Innovations – Development and challenges of Polish Integration in European Logistics Networks. Presentation at the Berlin-Brandenburg Conference "Logistics and Innovation – Success in a networked Europe", Volkswagen Distribution Centre Ludwigsfelde, 11-12/09/2008
- The Capital Region of Denmark (2008): The Capital Region of Denmark – an international metropolitan region with high quality of life and growth. Regional Development Plan, June 2008
- TransBaltic (2010): Baltic Motorways of the Sea, Successful projects, barriers and challenges for MoS policy implementation , on the basis of the Seminar and Debate held on 11th May 2010 in Sopot/Poland, July 2010
- v.Nordheim, H. & D. Boedeker (2000): Umweltvorsorge bei der marinen Sand- und Kiesgewinnung, BLANO-Workshop 1998, BfN-Skripten 23, Bonn-Bad Godesberg 2000
- Windenergy Network Rostock, Offshore Hafenatlas: Blätter Sassnitz, Stralsund, http://www.wind-energy-network.de/offshore-hafenatlas.html
- WWF (2005): MPA Fact Sheet WWF Baltic Ecoregion Programme: Pomeranian Bay, September 2005
- WWF (2010): Future Trends in the Baltic Sea, WWF Baltic Ecoregion Programme 2010

WWF Deutschland (2011): Schutz den Schutzgebieten, Anforderungen an ein ökosystemgerechtes Fischereimanagement in den Natura 2000-Gebieten in der Nord- und Ostsee, Berlin 2011

11. List of figures and tables

Unless otherwise stated, all maps were produced by BSH on the basis of BSH data. Other sources (data, maps) are referred to in the respective maps.

Appendix

Appendix 1: International and sectoral legislation affecting maritime space

a) International legislation

a) The United Nations:

- United Nations Convention on the Law of the Sea - UNCLOS,
- Convention on Biological Diversity – CBD,
- The Espoo (EIA) Convention,
- Aarhus convention,
- The UNESCO Convention on the Protection of the Underwater Cultural Heritage,

b) IMO:

- Resolution A.720 (17) by which the Assembly adopted the Guidelines for the Designation of Special Areas and the Identification of Particularly Sensitive Sea Areas,
- Resolution A. 672 (16) on Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone,
- MARPOL Convention,
- The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter - commonly called the London Convention,
- International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC),
- International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969-INTERVENTION 1969,
- The International Regulations for Preventing Collisions at Sea 1972 -COLREGS,

c) EU:

- Bird Directive,
- Habitat Directive,
- SEA Directive,
- EIA Directive,
- Marine Framework Directive
- various regulations mainly referred to fishery

d) Council of Europe:

- The Convention on the Protection of the Archaeological heritage of Europe, usually referred to as the Valletta Treaty or Malta Convention,

e) Helsinki Convention:

- in particular its recommendations 15/5, 17/3,19/1,19/17,21/4, 24/10, 25/4, 28E/9,

f) other conventions:

- The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or the Bonn Convention) including several additional Agreements such as EUROBAT to conserve populations of European bats and ASCOBANS related to small cetaceans of the Baltic, North East Atlantic, Irish and North Seas

Regulations of the United Nations Convention Law of the Sea (UNCLOS) are in force in the whole area covered by the plan. In the EEZ third countries have, in line with UNCLOS the freedom of navigation and flight, fishing, laying cables and pipelines and of other, conforming to international law, ways of using the sea, related to these freedoms.

b) Sectoral legislation

Navigation

In accordance with international (Article 58 of UNCLOS), navigation is allowed in the whole area of the plan. In 2005, the IMO Marine Environment Protection Committee (MEPC) granted the Baltic Sea the status of a Particularly Sensitive Sea Area (PSSA). With respect to sea space management this requires that safe deep sea navigation routes and coastal sea traffic zones must be established on the Baltic in order to ensure maximum safety of ships (and therefore prevent pollution of environment due to collision or breakdown) and simultaneously to protect nature and environment. In the area south of Bornholm a new deepwater route has been created.

Underwater Cultural Heritage

Archaeological heritage includes systems, structures, sets of buildings, exploited sites, objects, relics of other type, and also their neighbourhood located on earth or under water.

Archaeological and underwater cultural heritage will be protected in the whole area of the plan according to the following regulations:

- European Convention on the protection of archaeological heritage, La Valetta, 16 January 1992,
- UNESCO convention on protection of underwater cultural heritage of 2 November 2001 (after its ratification by Denmark, Germany, Poland and Sweden)

Environment

Countries have the exclusive jurisdiction in matters of maintenance and protection of marine environment in their respective EEZ (Article 56 UNCLOS).

Nature conservation is ensured by the respective national laws of Germany, Poland, Denmark and Sweden implementing the following EU legislation:

- Directive 92/43 EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.
- Directive 85/337 EEC amended by Directive 96/61/EC on EIAs,
- Directive 2001/42/EC of the European Parliament and Council of 27 June 2001 on SEAs.
- Directive 79/409EEC of 2 April 1979 on protection of wild birds.

Protection of environment against pollution by navigation is ensured by separate legislation,

- International Convention on prevention of pollution of the seas by ships of 1973, changed by the Protocol of 1978 (MARPOL), and

- Convention on the protection of the marine environment of the Baltic Sea, done in Helsinki on 9 April 1992, which provides for the use of Best Available Technology and Best Ecological Practice, which are defined in Recommendations 13/6 and 12/3 to that convention2,
- Convention on environmental impact assessment in transborder context, Espoo 25 February 1991,

Protection of environment from pollution by shipping is also facilitated by ensuring that priority areas for navigation do not overlap with priority areas for environmental protection.

EU Marine Strategy Framework Directive:

Together with the Water Framework Directive (WFD) and the Habitats Directive, the MSFD is set to become the most relevant instrument for the EU seas. The MSFD should be taken as setting the standards for environmental aspects in MSP.

With the implementation of the MSFD, knowledge of ecosystems, biodiversity and environmental conditions is expected to play a stronger role in MSP in the years to come. Key aspects to consider include:

> "good environmental status" (article 1.1), the achievement of which is outlined in 11 descriptors,

> "marine strategies", "protect and preserve the marine environment", "prevent and restore marine ecosystems", "no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea" (article 1.2a)

> "Marine strategies shall apply an ecosystem-based approach to the management of human activities, ensuring that the collective pressure of such activities is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised, while enabling the sustainable use of marine goods and services by present and future generations."

The following descriptors of good environmental status are at least partly within the competence of MSP:

MSFD Descriptor of good environmental status	**How MSP can contribute**
Descriptor 1: Securing biological diversity	Active use of information on the spatial distribution of species or underwater habitats (e.g. the submarine landscapes developed by BALANCE).
Descriptor 2: non-indigenous species which are introduced by human activities are at a level that does not negatively affect the ecosystem	Assessment of shipping routes and areas of ballast water exchange to derive spatial objectives for sustainable shipping.
Descriptor 3: the population of all commercial fish and seafood stocks are in safe biological limits and show population-, age and size structures which indicate a healthy status.	Active use of information on spawning stocks and nursery areas, as well as catch surveys as a tool for designating fisheries management areas and protected zones.
Descriptor 5: Eutrophication induced by human activities	Active use of information on eutrophication for siting decisions (including temporal uses).

	Translate HELCOM data into thematic maps for the MSP assessment phase. Relevant map layers could oxygen content, distribution maps for sea grass or other macrophytobenthos, or chlorophyll A in coastal areas.
Descriptor 6: the integrity of the sea floor is in a state that secures that the structure and the function of the ecosystem will be safeguarded and that benthic ecosystems will not be negatively affected.	As descriptor 1
Descriptor 7: the permanent alteration of hydrographic conditions does not negatively affect the marine ecosystem.	MSP can help secure this by ensuring that sea uses do not endanger hydrographic conditions.
Descriptor 11: Introduction of energy including underwater noise into the system stays on a level that does not negatively affect the marine environment.	MSP can play a role in minimising underwater noise (e.g. from shipping and offshore wind turbines) in proximity to important habitats/species. (e.g. considering buffer zones for porpoises)

Fishing and mariculture

In their EEZs, and therefore in the area of the plan, countries have the sovereign right to exploit and protect living resources of the sea. Limits are imposed by the EU Common Fishery Policy. Protection of environment against disruption and damage generated by mariculture is ensured by national law,

which implements, among others:

• EU legislation, especially:

- Directive 92/43 EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.
- Council Regulation (EC) No. 834/2007 of 28 June 2007 on organic production and labelling of organic products and repeating Regulation (EEC) No. 2092/91
- Council Regulation (EC) No. 708/2007 of 11 June 2007 concerning use of alien and locally absent species in aquaculture
- Commission Regulation (EC) No. 506/2008 of 6 June 2008 amending Annex IV to Council Regulation (EC) No. 708/2007 concerning use of alien and locally absent species in aquaculture
- The Convention on protection of the marine environment of the Baltic Sea area (ratified by the four countries), which provides for supporting the use of Best Available Technology and Best Ecological Practice and the Recommendations 25/4, 13/6, 12/3 to this Convention.

Linear infrastructure and technical infrastructure corridors

In accordance with international and national law the laying of underwater cables and pipelines is allowed in the whole area of the plan with the exception of areas where they could be a hindrance to navigation, the exploitation and investigation of natural resources of the EEZ by individual countries,

and where it could be a danger to the natural environment, to cultural heritage or a hindrance to fishing activities (Article 60 item 7 UNCLOS, relevant national legislation).

Protection of underwater cultural heritage against damage by linear infrastructure is ensured by separate legal regulations, implementing especially:

- The European Convention on protection of archaeological heritage,
- EU Directives, especially
    - Directive 85/337 EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment amended by Directive 96/61/EC,
    - Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of certain plans and programmes on the environment.

Protection of environment against disruption or damage by linear infrastructure is subject to separate national regulations implementing:

- EU directives, especially
    - Directive 85/337 EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment amended by Directive 96/61/EC,
    - Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of certain plans and programmes on the environment,
    - Directive 92/43 EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora,
- the ratified Helsinki Convention on the protection of the marine environment of the Baltic Sea area, providing for support of the Best Available Technology and Best Ecological Practice and its Recommendations 15/5, 17/3,19/17,13/6, 12/34.

Mining activities – use of natural resources

In their EEZ Poland, Germany, Denmark and Sweden have the sovereign right to exploit, protect and manage living and non-living natural resources of the sea water above the bottom, the seafloor and soil below the sea bottom.

Protection of underwater cultural heritage is ensured by the regulations listed in the section on linear and technical infrastructure

Protection of natural environment against disruption and damage by mining activities, as well as against increased fragmentation of the marine ecosystem, is ensured by separate national legislation implementing the Helsinki Convention (Recommendations 19/1, 19/17, 13/6, 12/35) and the EU Directives listed in the section on linear and technical infrastructure.

Power generation

In the area of the Plan countries have the sovereign right to produce power from water, currents and wind. Protection of underwater cultural heritage against damage by power production is ensured by separate regulations listed in the section on linear and technical infrastructure.

Protection of natural environment against disruption and damage by power production and against increased fragmentation of the marine ecosystem, including its habitats, is ensured by separate national regulations implementing the Helsinki Convention (Recommendations 19/1, 19/17, 13/6,

12/3.) and EU Directives listed in the section on linear and technical infrastructure which especially are in accordance with:

Scientific research

In accordance with international law (Article 238 UNCLOS), all States may carry out scientific investigations in the whole area of the plan, providing that they do not constitute a danger to other users (Article 240 UNCLOS). This freedom does not extend to investigation, exploitation and protection of living and non-living natural resources, sea waters covering the seafloor, the sea bottom and its subsoil which are covered by sovereign rights.

Appendix 2: Summary of national MSP legislation and other provisions affecting the pilot area (Tab. 12)

	DE	DK	PL	SE
Responsible bodies/institutions				
Coastal Zone / Internal Waters	Federal States: **Mecklenburg-Vorpommern** (Ministry of Transport, Building and Regional Development)	*Terrestrial:* Danish Agency for Spatial and Environmental Planning (part of Ministry of the Environment), municipal councils responsible for comprehensive land-use regulation at municipal and local level *Sea*: "Owner": Danish State, sovereign state regulates and manages the sea in public interest	*Terrestrial:* self-governmental authorities of municipality and/or voivodeship (province) *Coastal Waters:* national level: Ministry of Infrastructure; regional level: Respective Maritime Office (Szczecin, Slupsk, Gdynia) - Directors	Responsible for MSP: Municipalities (Planning and Building Act): County Administrative Board safeguards and coordinates public interests on the regional level, central administrative authorities provide CAB with planning information and national interests
Territorial Sea	as above	"Owner": Danish State, sovereign state regulates and manages the sea in the public interest	national level: Ministry of Infrastructure; regional level: Respective Maritime Office (Szczecin, Slupsk, Gdynia) - Directors	as above
Exclusive Economic Zone	Federal Government: Ministry of Transport, Building and Urban Development, Federal Maritime and Hydrographic Agency	as above	as above	Government responsible for coordination and management of sea space, delegation of responsibility to authorities where appropriate, including marine environment

Status of MSP				
Coastal Zone / Internal Waters	**M-V:** *Spatial Development Programme 2005*, revision/update in progress - M-V will improve and complement the Spatial Development Plan. With this, the topics fishing, port development, building on the water and shipping routes should be picked up.	no comprehensive plans or maritime planning instrument for sea space yet	no comprehensive plans or maritime planning instrument for sea space yet	Comprehensive Plan for total area of the municipality (no binding legal effect), Detailed Development Plan for limited parts, legally binding, No separate maritime planning instrument for wider areas or whole sea space, no MSP yet
Territorial Sea	**M-V:** *Spatial Development Programme 2005, revision/update in progress*	as above	as above	as above
Exclusive Economic Zone	**Germany:** Maritime Spatial Plan for the German Baltic Sea EEZ, came into force Dec. 2009	as above	as above	No discrete maritime planning instrument, no permanent national strategy and institutional coordination and planning for sea uses for the EEZ as yet.

Issues regulated/focus				
Coastal Zone / Internal Waters	**M-V:** regulations offshore: - priority / reservation areas raw materials, - suitable area offshore wind energy, - reservation areas pipelines, - priority and reservation areas nature protection and management, - reservation areas tourism	comprehensive spatial plans only cover terrestrial space only sectoral plans for sea space	comprehensive spatial plans only cover terrestrial space, only sectoral plans for sea space	
Territorial Sea	**M-V:** regulations offshore: - priority / reservation areas raw materials, - suitable area offshore wind energy, - reservation areas pipelines, - priority and reservation areas nature protection and management, - reservation areas tourism	only sectoral plans for sea space	only sectoral plans for sea space	

Exclusive Economic Zone	**DE:** regulations: - priority / reservation areas shipping - - priority areas offshore wind energy - gate high voltage cables for wind energy - reservation area research	only sectoral plans for sea space	only sectoral plans for sea space	
Planned Activities in MSP / legislation for MSP				
Coastal Zone / Internal Waters	**M-V:** revision/update of Spatial Development Programme 2005 in progress		**Work on new act on spatial management,** attempt to include land/sea interactions, Work on Polish NationalAct on Spatial Development - to include marine areas (chapter on spatial planning of sea areas), small changes in other acts i.a. to include ICZM principles into planning procedures, new ordinances on scope of sea spatial plans, requirements concerning planning and cartographic materials, symbols, nomenclatura and documentation of planning activities Preparatory projects: optimum location of wind farms, distribution of valuable habitats, safety zones, acceptable / prohibited sea uses	**Introduction of new planning for sea areas / proposal for new legislation** - municipalities still responsible for MSP

Territorial Sea	**M-V:** revision/up-date of Spatial development Programme 2005 in progress		as above	**Introduction of new planning for sea areas / proposal for new legislation** - currently a commission is developing a proposal for a draft bill, which could be the base for MSP in the territorial sea (starting from 1 nm beyond the base line) and EEZ. Proposal will be submitted to government by 01.12.2010. A new agency which could be responsible for MSP will start at 01.01.2011, a new bill could be in force by 01.01.2012.
Exclusive Economic Zone	**DE:** MSP in effect requires review of effectiveness of regulations regarding offshore wind energy, if necessary adjustment of regulations		as above	as above
Further MSP-related activities				
Coastal Zone / Internal Waters	ICZM - national strategy and state initiatives		**National Spatial Development Concept -** Development of vision / strategic plan for the whole Polish sea area and, gradually, of sea use plans for all problem areas further development / improvement of procedures (crossborder consultation)- joint planning with Russia	

Territorial Sea	Voluntary agreement for managing the Greifswalder Bodden area for fisheries (WWF)		**National Spatial Development Concept -** Development of vision / strategic plan for the whole Polish sea area and, gradually, of sea use plans for all problem areas further development / improvement of procedures (crossborder consultation)- joint planning with Russia sea use plans for all problem areas	
Exclusive Economic Zone	introduction of special arrangements for interventions: offshore installations are excluded from the compensation requirement up tp 2017		as above	
Related Legislation				
Coastal Zone / Coastal Waters	**M-V:** Mecklenburg-Vorpommern State Planning Act 1998 (last changed in 2011) **DE**: Federal Spatial Planning Act (revision/amendment 2009)	Coastal zone - landside: Planning Act 2007, Nature Protection Act seabased activities: regulated by sectoral laws (raw materials, subsoil, electricity supply, harbour act, fishery acts etc.), Natura 2000 and water quality: Environmental Objective Act seaside: no specific planning act for sea space no legal instrument to coordinate activities between land and sea	Act on Maritime Areas of Poland and Maritime Administration as of 1991 (last am. 2005) Act on Spatial Planning and Management 2003 Ordinance by the Council of Ministers on qualifiying minimum and maximum width of technical and protective belts and method of marking their borders 2003	today: Swedish Planning and Building Act (PBA) 1987, rev. 2007 (regional plan, comprehensive plan, detailed development plan), Environmental Code

Territorial Sea	as above	sea: no specific planning act for sea space	as above	today: as above, plus: Swedish Territorial Waters Act (1966, mod. 1978) Continental Shelf Act (1966. Mod. 2007) - further sectoral legislation (Fisheries, Minerals, Electricity etc.)
Exclusive Economic Zone	**DE:** Federal Spatial Planning Act (revision/amendment 2009)	sea: no specific planning act for sea space	as above	today: Swedish Exclusive Economic Zone Act (1992, mod. 1998)

Appendix 3: Spatial planning documents and strategies with relevance to the pilot area

Denmark

National level: An Integrated Maritime Strategy (2010)

Objectives with impact on MSP:

- To promote the excellent growth potential for the maritime industries, which are of key importance to the Danish economy (especially shipping, fishing and tourism); there is a corresponding focus on ports and transport infrastructure,
- To reduce greenhouse gas emissions and air pollution (e.g. from shipping),
- To protect the marine environment and the coastal zone, which includes the promise to ensure the implementation of the marine strategy framework directive as an environmental basis of the coming years' sustainable development of the maritime sectors,
- To achieve enhanced safety at sea,
- To better coordinate initiatives in the maritime field, which includes the promise to follow progress with MSP initiatives in the EU and put forward proposals for the future practice in terms of maritime spatial planning in Denmark.

Kommuneplan (2009) for Bornholm:

- Aim: to become 100% carbon-neutral based on sustainable and renewable energy
- Increase the population, the number of workplaces, and reduce seasonal fluctuations.

Sweden

Key cross-sectoral strategies and programmes:

- Regionalt Utvecklingsprogram for Skåne 2009 - 2016
- Planning and Building Act (1987): regulates spatial planning of land and water and building. The Act consists of regulations of how comprehensive plans should be established and accomplished, and how public interests should be considered when planning for land and water areas.
- The Environmental Code (1999): brings together the Swedish central environmental legislation. The Planning and Building Act and the Environmental Code form a basic framework for policy integration across sectors, for example, fishing, agriculture, forestry, and energy.
- The Swedish National Maritime Policy Bill (2009): introduces the concept of integrated MSP and the need for legislation and planning in the EEZ.

At the local level, the relevant document is the Regionalt Utvecklingsprogram for Skåne 2009 – 2016 and the Skane tourism strategy („Produkt- och destinationsutveckling“ - strategiska initiativ för utveckling av besöksnäringen i Skane“(2010).

Poland

Key cross-sectoral strategies and programmes:

- National Development Strategy (NDS) 2007-2015

- National Reform Programme (NRP) for 2008-2011 to implement the Lisbon Strategy
- National Concept of Spatial Development (KPZK)
- Development strategies of coastal regions
- Innovative Economy Operational Programme2007-2013
- Operational programme Infrastructure and Environment

At the regional level:

- Spatial development plan of Zachodniopomorskie Voivodeship to 2020, which takes into consideration all international, national and regional documents,
- Zachodniopomorskie Voivodeship Development Strategy to 2020, where topics of particular importance include strategic cohesion with the border regions of Poland, Germany, Denmark and Sweden as well as with other Baltic countries.
- Strategy for developing the maritime sector in Zachodniopomorskie region until 2015 since this directly concerns maritime problems (although its general provisions are also covered in the spatial development plan)

At the local level (coastal municipalities):

- Studies on the communes land use conditions and directions
- Local spatial development plans for communes

Sectoral national strategies:

- Strategy and action plan for wetland conservation in Poland for the years 2006-2013 with cost calculation
- National Ecological Policy 2003-2006
- National Ecological Policy 2009-2012
- National strategy for protection and sustainable use of biodiversity including Action Plan 2007-2013
- Strategy of seaport development to 2015
- National Transport Policy 2006-2025,
- National Strategy of Fisheries Development for 2007-2013
- Operational programme fish
- National Energy Policy to 2030(draft)
- Strategy for development of Polish maritime economy for years 2007 – 2015 - the interim report from implementation on 2008

Germany

Key cross-sectoral planning and programmes:

- German EEZ: Raumordnungsplan für die deutsche ausschließliche Wirtschaftszone in der Ostsee
- Territorial Sea Mecklenburg-Vorpommern: Landesraumentwicklungsprogramm Mecklenburg-Vorpommern

- Regionales Raumentwicklungsprogramm Vorpommern, August 2010

In the pilot area Germany has the only legally binding planning documents with explicit reference to Maritime Spatial Planning. They are the Landesraumentwicklungsprogramm Mecklenburg-Vorpommern (LEP) (for the Territorial Sea Mecklenburg-Vorpommern), and the Raumordnungsplan für die deutsche ausschließliche Wirtschaftszone in der Ostsee (for the German EEZ).

A different approach is taken to MSP in the territorial sea and the EEZ. Partly, this is the result of different MSP 'philosophies', but partly also of different constraints experienced in drawing up the respective MSPs. The differences in approaching MSP manifest themselves in the different zoning concepts that are applied. Mecklenburg-Vorpommern's Spatial Development Plan for the 12-sm zone recognises three area types:

- Priority areas, which are reserved for a defined use. Other uses conflicting with the priority use are excluded.
- Reservation areas, which are reserved for uses given special weight in the planning process. A case-by-case decision is made here: Other uses may be permitted if a comparative analysis shows their significance and the lack of acceptable alternatives.
- Suitable areas, which are the only areas where specific uses are permitted. The defined use for these areas is precluded elsewhere. Offshore wind farms for example can only be built within the two suitable areas for wind farm development and are not permitted elsewhere.

In contrast, the Spatial Development Plan for the EEZ only recognises two types of area:

- Priority areas (for shipping and offshore wind farming),
- Reservation areas (for shipping and research).

The German EEZ (pilot project area only):

The MSP for the EEZ includes:

- a network of **priority areas** for shipping (based on the existing and planned TSS and major shipping routes) with adjacent **reservation areas**,
- a **priority area** for offshore wind energy plus a "gate" at the territorial sea boundary through which energy cables from future wind farms to the coast must pass,
- **Reservation areas** for research.
- Within nature conservation areas (Natura 2000, shown in the plan for information only) no wind farms may be built. No fixed installations may be built in shipping routes. Safety zones have to be maintained around any offshore wind farms and shipping routes.

The LEP (Spatial Development Programme) M-V:

The applicability of the LEP has been extended into coastal waters (12sm-zone) to ensure conflict management between the demands of new technologies (offshore wind energy sites), tourism and nature conservation, and traditional sectors like shipping, fishing and coastal defence at an early stage.

The binding objectives, principles and other requirements of spatial planning represent the framework for further development of the sea area. This framework guides those involved in public planning, but also those representing private interests when they are planning measures with spatial impacts.

The goal of the LEP is to implement the principles of sustainable spatial development, bringing together territorial social and economic requirements with the ecological functions of the area, leading to long-term, large-scale and balanced spatial development.

Tasks:

- The guidelines for spatial development which introduce the programme represent the main focal points for the region's future development.
- The LEP (Spatial Development Programme) M-V is strategic in character and outlines the priorities for Baltic Sea use in the coastal waters of Mecklenburg-Vorpommern. Of special importance regarding MSP is the 12th guideline, which aims to secure the use of the potentials of the coastal waters.

The LEP (Spatial Development Programme) M-V features the following areas:

- **priority areas for mineral resources** with regard to use for coastal protection, and reservation areas for commercial purposes
- **reservation area** / corridor pipelines with regard to the NordStream pipeline and electricity cables in the inland waters part of Greifswald Bay
- a **suitable area** for offshore wind energy (projects are subject to a spatial planning procedure)
- **reservation areas** for tourism, covering some coastal areas but also inland waters.
- The main shipping routes have been visualised in the map, but in general the whole territorial sea is seen as a federal waterway
- Nature conservation areas are either **priority areas** (for nature and countryside conservation reasons) or **reservation areas**. Priority areas comprise National Park areas and nature reserves. Reservation areas comprise areas to be designated under the Habitats Directive, coastal waters and near-natural coastal areas classed as showing "undisturbed development of nature" (see LEP p. 44 Fig. 12 and 13).

The Regional Spatial Development Programme Vorpommern (RREP)

One of the major issues of the Regional Spatial Development Program Vorpommern (RREP) is further developing **the maritime transport** infrastructure. Sassnitz-Mukran along with Rostock is the most important sea port in M-V for Baltic Sea cargo and ferry traffic. Thus the document stresses further enhancement with regard to the transeuropean traffic network, with the foremost regional competence in multimodal cargo and passenger transport. Main shipping routes to and from M-V /pilot area are Sassnitz – Gedser / Trelleborg / Scandinavia resp. Sassnitz to Finland / Russia / Baltic States. One project within the EU's Motorways of the Sea (MOS) concept is the „Königslinie"[19] from Sassnitz to Trelleborg – for which further investments are planned. Minor sea ports include Stralsund, Wolgast, Greifswald, Vierow, Üeckermünde-Berndshof, Lubmin. Dangerous goods are only being handled in Greifswald-Ladebow, the industrial port Lubmin serves the companies in the industrial area of Lubmin. Ferry lines serve everyday traffic but also attract tourists. They shall be further developed, e.g. to outside of planning area (destinations e.g. Klaipeda, St. Petersburg).

[19] „High - Quality Rail and Intermodal Nordic Corridor"

Tourism is one of the most important economic sectors in Mecklenburg-Vorpommern, in particular in Vorpommern[20], with the coastal area the most attractive and the coastal islands tourist hotspots. The RREP assigns high value to tourism and defines focus areas and development areas for tourism mainly along the coast[21]. The document stresses the need to ensure accessibility and usability of sea space.

Tourism focuses on family/summer holidays, taking advantage of beaches, facilities for water sports / sailing, and the scenery and cultural heritage (incl. cities Stralsund / Greifswald). Ports are also important with regard to tourism as starting points and destinations for leisure and excursion boats. Leisure boat sailing mainly takes place within coastal waters and is being serviced by a dense harbour network. Maritime traffic between resorts has a long tradition and is to be extended, so the respective water areas should be kept open. Cruise shipping is considered to have high potential for growth.

Fishery plays a traditional role in Vorpommern and still contributes to the regional economy, e.g. fish processing in Sassnitz. Fishing ports are also attractive places for tourists to visit. Attractive conditions are to be maintained / developed.

ICZM is a voluntary tool to be used to mitigate conflicts between spatial claims. Thus there is a precept for coordination in the territorial sea (OWF, linear infrastructure, nature conservation, tourism, securing supply of raw materials for coastal protection and commercial uses, safety and efficiency of sea traffic, underwater cultural heritage, fishery, aquaculture, military/defence, dredging of waterways, dumping of dredged materials etc.).

Based on a development concept for Greifswald Bay with detailed regulations/restrictions (temporal, all-year) etc. of use, such as water sports, further spatial planning regulations were drawn up. Since 2005 a voluntary agreement has been in effect with water sports and anglers clubs with spatial and temporal regulations in Greifswald Bay and the sound leading to Stralsund.

[20] with ca. 11,1 % GDP, share of people in paid work 15,1 %, share of overall turnover 12,5 %, , ca. 120,000 jobs, in VP – ca. 55 % of beds and overnight stays in M-V. (State Statistical Office M-V)
[21] Darss/Zingst, Hiddensee, Rügen North of Wieker / Jasmunder Bodden, Prorer Wiek, Sellin/Baabe/Göhren/Middelhagen, Usedom Pomeranian Bight coast, Middle part until Bansin

The BaltSeaPlan project in general

Activities

BaltSeaPlan activities were designed to support all major aspects of maritime spatial planning within the Baltic Sea region:

> Improving the joint information base / stocktaking for maritime spatial planning:

A forum for dialogue bringing together spatial planners and scientists and identify sources of data / information. Compiling current uses, conflicts and natural values of the Baltic Sea. Filling data gaps, exchange of data, improve integration of ecological and socio-economic data sets, identify relevant modelling methods, clarify MSP data needs.

> Including Spatial Planning in National Maritime Strategies

Assessment of national frameworks, methodologies and sectoral strategies that influence the use of sea space (e.g. energy, fishery, transport, tourism, as well as nature conservation)

Developing recommendations on spatial issues within National Maritime Strategies.

Exploiting the visions to foster a national cross-sectoral debate, discussing goals & targets for dealing with space and filling gaps in national sectoral policies & strategies

> Develop a Vision for Maritime Spatial Planning in the Baltic Sea 2030

taking into account transnational interdependencies and cumulative impacts

initiate a Baltic Sea region wide campaign as to discuss the BaltSeaPlan Vision 2030

> Demonstrate MSP in 8 pilot areas

- Danish Straights / T-Route (DK)
- Pomeranian Bight (DE/DK/SE/PL)
- Western Gulf of Gdansk (PL)
- Middle Bank (SE/PL)
- Lithuanian Sea (LT)
- Latvian Sea (LV)
- Pärnu Bay (EE)
- Hiiumaa and Saaremaa Islands (EE)

> Lobbying and capacity building for MSP

- stakeholder involvement & participative planning methods
- BaltSeaPlan series of guidelines & policy recommendations
- workshops & conferences for decision-makers

Partners

Germany

- Federal Maritime and Hydrographic Agency (BSH), Lead Partner
- Ministry of Energy, Infrastructure and Regional Development of Mecklenburg-Vorpommern
- WWF Germany, Baltic Sea Unit

Poland

- Maritime Office in Szczecin
- Maritime Office in Gdynia
- Maritime Institute in Gdańsk

Denmark

- Department of Bioscience, Aarhus University (formerly National Environmental Research Institute – NERI)

Sweden

- Royal Institute of Technology (KTH)
- Swedish Environmental Protection Agency

Estonia

- Estonian Marine Institute of University of Tartu
- Baltic Environmental Forum Estonia

Lithuania

- Klaipėda University Coastal Research and Planning Institute (CORPI)
- Baltic Environmental Forum Lithuania

Latvia

- Baltic Environmental Forum Latvia

BaltSeaPlan Publications

- BaltSeaPlan Findings
- BaltSeaPlan Vision 2030 – Towards the sustainable planning of Baltic Sea space
- Become a Maritime Spatialist within 10 Minutes (EN, DE, LV, LT, PL, EE)
- BaltSeaPlan Bulletin #1
- BaltSeaPlan Bulletin #2
- BaltSeaPlan Project Flyer (EN, DE, LV, LT, PL, EE, SE)

BaltSeaPlan Reports

Impact Assessments

1 - Strategies with relevance for Estonian maritime space
2 - Strategies with relevance for German maritime space
3 - Strategies with relevance for Latvian maritime space
4 - Strategies with relevance for Lithuanian maritime space
5 - Strategies with relevance for Polish maritime space
6 - Strategies with relevance for Russian maritime space
7 - Strategies with relevance for Swedish maritime space
8 - Implications of the international and national policy context for Baltic Sea space and MSP

Pilot MSP reports

9 - Developing a Pilot MSP for the Pomeranian Bight and Arkona Basin
10 - Developing a Pilot MSP for the Middle Bank
11 - Developing a Pilot SEA for the Western Gulf of Gdansk
12 - Preparing for a MSP at the Danish Straits
13 - Towards a Pilot MSP for the Pärnu Bay
14 - Towards a Pilot MSP for the Saaremaa and Hiiumaa Islands
15 - Towards a Pilot MSP for the Lithuanian Sea
16 - Developing a Pilot MSP for the Western Coast of Latvia

MSPs and SEA

17 - Pilot MSP for the Western Coast of Latvia (LV)
18 - SEA for the Western Gulf of Gdansk (PL)

Technical reports

19 - Modelling for MSP – Tools, concepts, applications
20 - Data exchange structure for MSP
21 - Effects of underwater noise on harbour porpoises around major shipping lanes
22 - Remote sensing methods for detecting small fishing vessels and fishing gear
23 - Legal and planning options for integrating fisheries into Maritime Spatial Planning
24 - Stakeholder Involvement in MSP
25 - SEA in MSP: Recommendations from the German and Polish experience
26 - Fisheries in the MSP context
27 - Seabed and habitat mapping in the Hatter Barn area
28 - BaltSeaPlan Web-advanced tool in support of MSP
29 - Case Study: Systematic site selection for offshore windpower with Marxan in the pilot area Pomeranian Bight
30 - Case Study: Site selection of fisheries areas for MSP
31 - Recommendations for legislative action regarding the MSP in Europe

Maritime Spatial Planning (MSP) has become a widely acknowledged and necessary tool for co-ordinating spatial use and balancing of interests in the sea. In view of expanding activities such as offshore wind energy parks and growing shipping traffic and at the same time increasing needs to protect the marine environment a systematic, integrative and forward-looking planning is required in order to safeguard the sustainable development of the seas. Currently, however, this tool is far from being established practice.

The 3.7 million € INTERREG IVB project "BaltSeaPlan" (2009–2012) has been the largest project in recent years dealing with maritime spatial planning throughout the Baltic Sea Region. Under the lead of the German Federal Maritime and Hydrographic Agency (BSH) and covering partners from all Baltic Sea countries (except Finland) the project has not only developed pilots in 8 demonstration areas, but also advanced methods, instruments & tools as well as data exchange necessary for an effective maritime spatial planning.

The results of BaltSeaPlan are published in a series of reports all available for free download under www.baltseaplan.eu.

The area of the Pomeranian Bight and Arkona Basin is situated between Denmark, Germany, Poland and southern Sweden west of the island of Bornholm. The area is subject to many uses and interests, such as shipping (with many ferry connections passing this area), offshore wind energy developments, sand & gravel extraction, pipelines & submarine cables, while at the same time being significant for nature conservation, fishery and tourism. BaltSeaPlan Report № 9 "Developing a Pilot Maritime Spatial Plan for the Pomeranian Bight and Arkona Basin" not only lays out the transboundary spatial plan developed jointly by an international working group, but also shows the challenges and possible solutions of a process involving five planning areas subject to different interests and planning cultures as well as varying availability of background information.

Baltic Sea Region
Programme 2007–2013

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