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SEAPLANSPACE
Country Specific Manual Lithuania
Coastal and Marine Spatial Planning in Lithuania

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- SEAPLANSPACE -

Country Specific Manual

Coastal and Marine Spatial Planning in Lithuania

Content

Maritime Spatial Planning in Lithuania

1 Introduction

The Republic of Lithuania is located on the south-east coast of the Baltic Sea. It is predominantly a continental country with only 90 kilometres of the marine coastline. Only five other European countries - Montenegro, Slovenia, Belgium, Bosnia and Herzegovina and Monaco have a shorter marine coastline that the one of Lithuania. As a result, Lithuania has the shortest Baltic Sea coastline of the nine countries surrounding the Baltic Sea – Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, and Sweden – and, therefore, Lithuania has the smallest area of the territorial sea, the contiguous zone and the Exclusive Economic Zone (hereinafter referred to as the EEZ) of the Baltic Sea.

Yet, in spite of the short length of the waterfront and the maritime territory under its national responsibility, the maritime territory of Lithuania encompasses a vast and very diverse coastal and marine region of the Baltic Sea and the Curonian Lagoon with sand dunes, estuaries, large river delta and a coastal lagoon. Therefore, the Maritime Spatial Planning (thereinafter in the text referred to as MSP) approach in the Lithuanian case covers a wide range of issues and target areas - from conservation and maintenance of pristine deltaic nature reserves located 60 kilometres inland from the coast to the development of industrial seaports and seaside resorts.

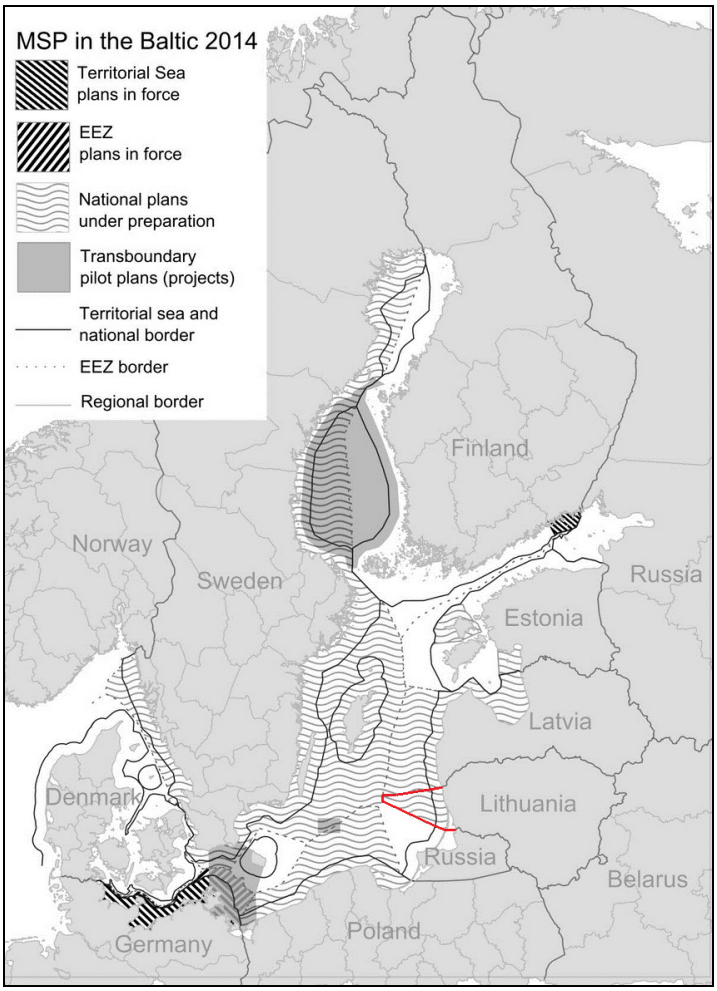

Figure 1: Maritime territory of the Republic of Lithuania in the Baltic Sea (Source: Backer 2015, based on Zaucha 2014)

2 Delimitation

According to Article 47 of the Constitution of the Republic of Lithuania, the exclusive right to the Lithuanian maritime area belongs to the Republic of Lithuania. The maritime area of Lithuania borders Latvia to the north, the Russian Federation to the south and Sweden in the western part. The area within a 20m water depth is part of the coastal zone. Current governance of the sea space is defined by legal acts relating to the use of the maritime space and responsibilities of the Republic of Lithuania as stipulated in international treaties and agreements in which it participates.

The Master Plan of the Territory of the Republic of Lithuania is supplemented with the maritime part (Fig. 1). The Lithuanian maritime territory was delimited by the Decree of the Government of the Republic of Lithuania of 6 December 2004, No. 1597 and includes internal waters, territorial waters, the EEZ, the sea bottom and the soil underneath, as follows (Fig. 2):

- Internal waters (lagoons not included): 35 km^2
- Territorial waters (12-nm zone): 1816 km^2
- Exclusive economic zone including the contiguous zone: 4586 km^2

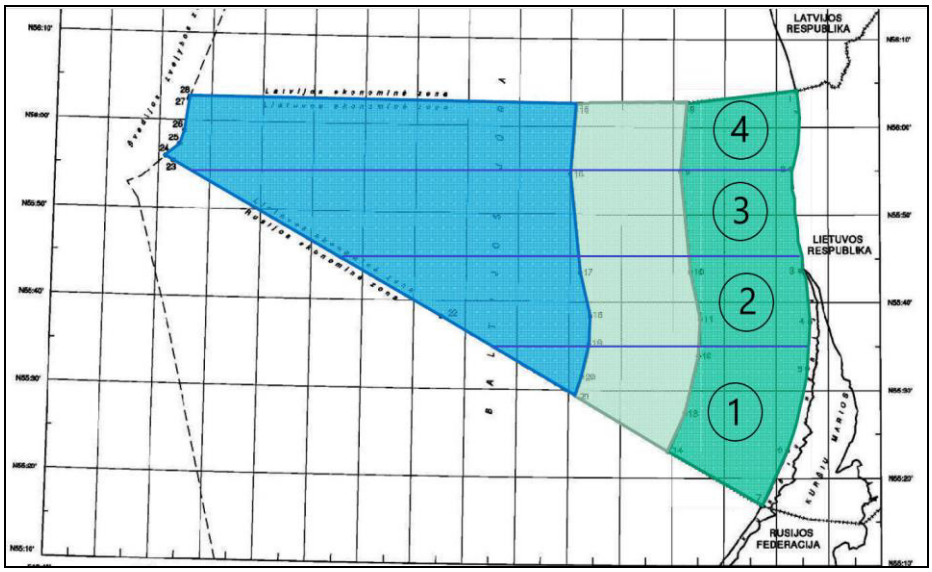

Figure 2: Three different zones of the maritime territory of Lithuania (Source: Ministry of Lithuania). From the administrative point of view, it is convenient that the entire maritime territory of Lithuania belongs to one (Klaipeda) county. Hence a relatively smooth MSP process

3 Description of the Coastal Zone and Maritime Territory of Lithuania

The Lithuanian maritime territory of the Baltic Sea belongs to the Eastern Gotland sub-basin of the Baltic Proper and the southeast Baltic region of graded coasts. The underwater topography of the Lithuanian maritime territory with the prevailing geomorphological features of Klaipeda-Ventspils underwater plateau and the submerged relic valley of the Nemunas River as well as the graded coasts of the Baltic Sea in Lithuania took their present shape very recently – during Pleistocene and Holocene. Within this strip of glacial marine bottom and graded coasts, which stretches northwards from Cape Taran in Sambian peninsula to Cape Kolka in Courland peninsula, deposits of glacial and marine sand accumulation prevail.

From the administrative point of view, it is convenient that the entire maritime territory of Lithuania belongs to one (Klaipeda) county, which consists of seven municipalities. Five of them (Klaipeda, Neringa and Palanga cities, as well as Klaipeda and Silute rural districts) are situated on the Baltic Sea and / or the Curonian Lagoon coast. Four marine and coastal sub-regions could be distinguished along

the Lithuanian Baltic Sea coast. Conventionally, for the MSP planning purposes and ignoring slight differences in the bottom topography and habitats, these four sub-regions can be delimited by the 55°35', 55°45' and 55°55' parallel lines (Fig. 2). Remarkably, this delimitation also roughly coincides with the division of the Baltic Sea coast among the four municipalities of Lithuania – Neringa, Klaipeda and Palanga cities and Klaipeda rural district (rayon).

1) Slight accretion prevails between Nida and Juodkrante. Shoreline is relatively stable there. The beach is relatively wide, covered with medium-sized sand with admixture of gravel. It is framed by the 6 to 8 m high artificial foredune. The marine bottom is relatively shallow. It is covered by sand deposits with *Macoma baltica* benthic communities. Glacial deposits appear on the bottom surface at the depth of 16-18 m, i.e., in the euphotic zone. The foredune is covered by marram grass, sea rocket and other perennial grasses, while the dune blow-outs are overgrown mainly by willows. The foredune was artificially created in the 19th century in order to protect coastal villages from the devastating sand drift. It stretches along the entire Lithuanian Baltic coast except few places in the Littoral Regional Park north of Klaipeda.

2) The marine and coastal sub-region between Juodkrante and Melnrage is characterized by a relatively strong accretion. The average advance of the shoreline to the sea is up to 2 m there (except the places adjacent to the Seagate of the Klaipeda harbour). The beach is wide (50-70 m), covered with a well-sorted medium-sized sand. It is framed by a 12 to 14 m high artificial foredune. The marine bottom is gently sloping seawards with three shoals parallel to the coast in the nearshore. The bottom is covered with sand deposits with *Macoma baltica* communities down to the 20-30 m depth.

3) The marine and coastal sub-region between Melnrage and Nemirseta is characterized by a moderate erosion and shoreline retreat up to 1 m annually. Glacial coastal scarps and bluffs prevail here covered with the sand of the Holocene Aeolian accumulation and forming coastal formations, which are unique for Lithuania. A steep ancient slope of the Holocene marine terrace formed by the Litorina sea transgression forms another important coastal landscape feature with coastal wetlands, rivulets and dense mixed old forest plantations. It gradually descends down northwards and southwards from the parabolic dune of Olando kepure, where it reaches 25 to 29 m altitudes.

   The height of the coastal cliff near the Olando kepure is up to 24,4 m high at Karkle. The cliff is active, not covered by vegetation, with numerous traces of landslides and landslips, fallen trees and sliding bushes. A relative height of the ancient slope of the Holocene marine terrace varies from 8 to 11 m. The beach in the strip between Melnrage and Nemirseta is relatively narrow, 15-25 m wide, covered with mixed sediments, where the gravel prevails with admixture of medium-sized sand, pebble and boulders.

   The slop of the marine bottom is relatively steep, covered with fine sand, it has a hard bench of boulders, pebble and gravel. Here on the varied hard bottom sediments covered with communities of *Mytilus edulis* with the sufficient penetration of sunlight the most favourable conditions form for the greatest biodiversity in the entire eastern Baltic Sea area. Therefore, this area is one of the most important spawning places for the Baltic herring. Below the hard-bottom area in the aphotic zone of 25-30 m depth the conditions for the marine life are much worse.

4) North of Nemirseta, grading of the coast created favourable conditions for sand accretion during the series of the Baltic Sea transgressions throughout the Holocene. The shoreline is relatively stable (except the places adjacent to the Palanga pier and Butinge wastewater discharge pipeline). The beach is relatively wide (50-90 m), covered with a well-sorted medium-sized sand. The beach is framed by a 3 to 6 m high artificial foredune. The foredune is covered with marram grass, sea rocket and other perennial grasses, while the dune blow-outs are overgrown mainly by

willows. The marine bottom is relatively shallow, coverned with sand deposits with *Macoma baltica* communities.

Glacial deposits appear on the bottom surface at the depth of 4-6 m, i.e., still in the photic zone. Here also the varied hard bottom sediments covered by the communities of Mytilus edulis with sufficient penetration of sunlight form favourable conditions for biodiversity. Therefore, this area is also among the most suitable spawning places for the Baltic herring. Behind the foredune there is an ancient coastal accumulative plain covered with the sand of the Holocene Aeolian accumulation. The terrace is dotted with numerous coastal wetlands, rivulets, pine-forest plantations.

4 Legislative background

Article 47 of the Constitution of the Republic of Lithuania says that the Republic of Lithuania has exclusive rights to its delimited continental shelf in the Baltic Sea. The following national legislation acts are pertinent for marine spatial planning in Lithuania:

- Spatial Planning Act;
- A new draft of the Spatial Planning Act, which also covers the maritime territory of Lithuania;
- Act of Land;
- Marine Environmental Protection Act;
- Coastal Zone Act;
- Environmental Protection Act;
- Energy Act;
- Renewable Energy Act;
- Resolution of the Government of the Republic of Lithuania on the Implementation of the Act of Construction of the Republic of Lithuania;
- Building permit regulations.

There are more than 20 legal acts (Parliamentary Acts and Governmental Decrees) guiding the use of the maritime territory of Lithuania. According to the national law (Marine Environmental Protection Act), the territorial waters of the Republic of Lithuania (thereinafter referred to as 'Territorial Waters') is a 12 nautical mile stretch of the Baltic Sea offshore zone off the coast of the Republic of Lithuania. It is defined by international treaties of the Republic of Lithuania, generally recognized principles and norms of international law.

Part of the marine space (up to 20 m isobath) falls under the regulation of the Coastal Zone Act of the Republic of Lithuania. In addition, Lithuania is a signatory state of the UN Convention on the Law of the Sea. The Marine Environment Protection Act defines the Exclusive Economic Zone of the Republic of Lithuania as part of the Baltic Sea beyond the territorial sea where the Republic of Lithuania has certain sovereign rights, jurisdiction and duties established by laws and international agreements of the Republic of Lithuania. Its boundaries are defined by international agreements of the Republic of Lithuania and generally recognized principles and norms of international law.

In Lithuania, there is no specific legal act dealing with maritime spatial planning. The MSP is implemented based on the existing Spatial Planning Act by supplementing the existing Master Plan of the Territory of the Republic of Lithuania with marine spatial solutions (both for territorial waters and the EEZ). The revised Spatial Planning Act adopted on 27 June 2013, which came into force on 1 January 2014, includes stipulations on planning for the sea space. The same stands at different levels of planning are included in the Rules of Complex Territorial Documents Preparation adopted by the Minister of Environment Order No. D1-8 on 2 January, 2014 as an executive legal act, following the revised Spatial Planning Act.

The Ministry of Environment, as organizer of the national level spatial planning document, launched the preparation of this complementary plan to cover both territorial waters and the EEZ. The marine part of the Master Plan of the Republic of Lithuania was completed in December 2013. After consultations and approval by the Lithuanian Parliament the Plan became an obligatory spatial planning document. The key planning objectives were to:

1) Foster investments for economic development
2) Maintain balance between good ecological status and sustainable economic development in marine areas
3) Protect, rationally use and restore natural resources and cherish natural and cultural heritage and recreational assets
4) Harmonize the interests of private and legal bodies, the general public, as well as municipal and national levels regarding the use of marine areas and conditions for development of different maritime activities.

According to the Spatial Planning Act (1995), the master plans of territory of the Republic of Lithuania, territories of counties, municipalities and their parts are obligatory planning documents in order to ensure the long-term sustainable development and reasoned use of the area, finances and natural resources. During the planning of the Lithuanian marine areas, new functional Contiguous Zone was established. Already existing in terrestrial plan – Coastal zone (including territorial waters) was prioritized for recreation, nature conservation and fishery as well as transport. Newly established Contiguous Zone is an area that has a specific functional role (see also Mileriene et al. 2014). Defined priorities here are shipping, fishing and development of marine infrastructure for oil prospect and marine energy projects.

The Master plan considers the possibility for exploration and exploitation of marine mineral resources in marine area of Lithuania, except near shore and marine protected areas. The exploration of marine mineral resources in Lithuania is not started yet, therefore the specific, most suitable or reserved areas could not be defined at this stage. As a result of planning, several main zones have been distinguished:

- Nearshore zone up to 20 m water depth – important zone for land and sea interaction, ports development, area where most of the biological assets are concentrated, zone important for recreation and coastal stability.
- Sea floor elevations – Klaipėda-Ventspils Plateau and Klaipėda Bank in the north and Curonian-Sambian Plateau in the south are characterized by relatively shallower waters in the open sea – favourable conditions for marine infrastructure development and mineral resources extraction and potentially suitable for development of valuable bottom habitats.
- The deepest parts of the marine area – Gdansk Basin, the relic valley of the Nemunas River and the slopes of Gotland Basin are reserved for navigation, fishing and future needs.

The developed map of planned marine activities (Fig. 3) delineates seven functional regions with specific prioritization for marine activities. Each of the region has the unique set of the priority sea uses identified and indexed to reflect the primary and secondary group of uses to be developed in the delineated region.

These zones are:

1) decentralized development;
2) use of renewable energy sources;
3) shipping;
4) military training and ecosystem conservation;
5) mixed purpose;

6) port development and
7) protection of coastal ecosystem.

The conceptual solutions supplementing the Master Plan with the marine part were based on MSP principles developed by the Cross-border Oceanographic Commission of UNESCO, adopted by VASAB – HELCOM and followed by the actions defined in the EU Baltic Sea Region Strategy Action Plan. Both were based on specifics of natural framework and conditions required to facilitate the developments of future uses as well as optimize existing ones. Relevant for planning data is research based, limited in time and funding. This often results in discontinuity and fragmentation of the knowledge. Dispersal of data is a problem at both national as well as the pan-Baltic scale.

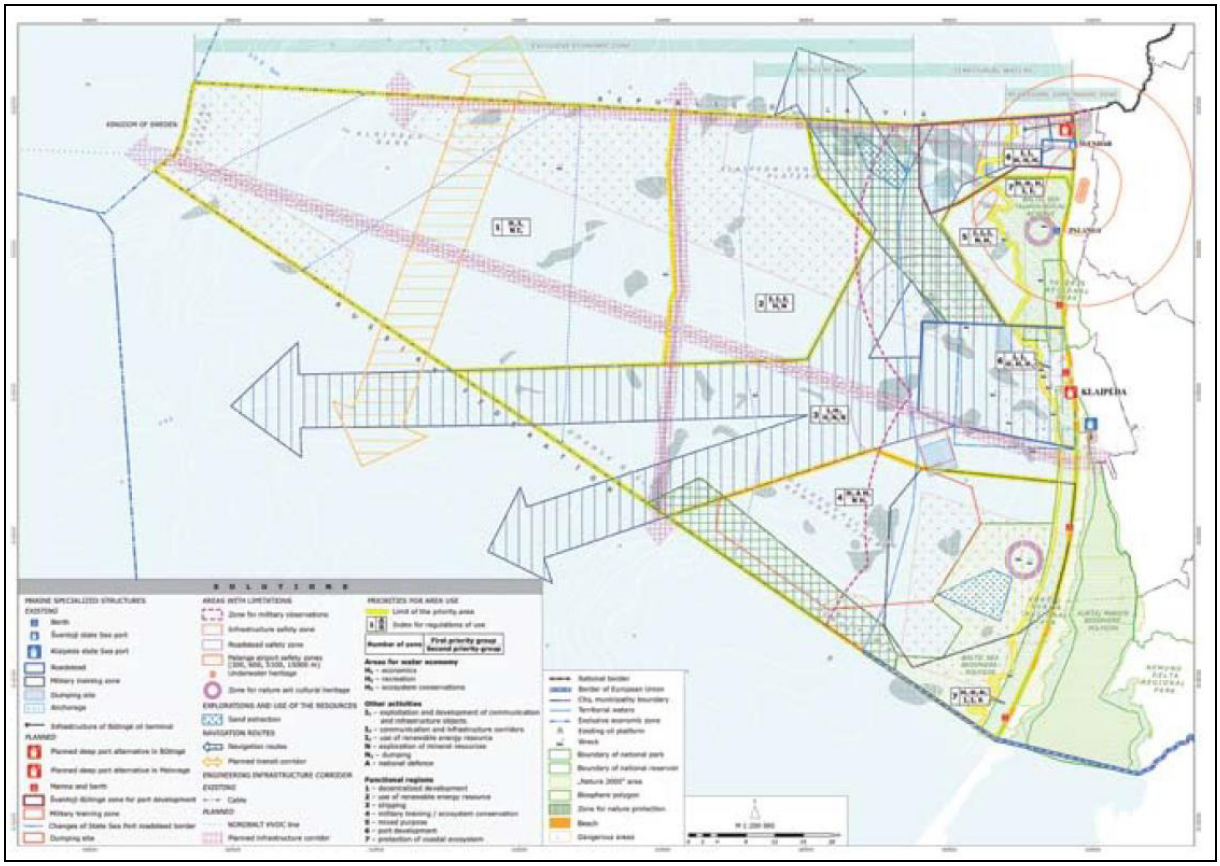

Figure 3: The map of planned marine activities according to the Master Plan of Lithuania (2015)

The Maritime Territory of the Republic of Lithuania in the Baltic Sea has been analysed in accordance with the Master Plan of the Republic of Lithuania and other publicly available documents. The spatial and temporal resolution of the available data is also highly influencing the resolution and quality of the plan (Zaucha 2014). In order to facilitate planning, complex environmental information needs to be translated into parameters, which can be used in the assessment. However, it is not always clear which parameters are actually needed or even suitable for the planning purpose. Usually, planners cannot use basic ecological information unless there are clear procedure for translating ecological and hydrographic data into relevant planning information – generalized and integrated maps and schemes.

The results of MSP principles application for the offshore wind energy (thereinafter referred to as OWE) development and selection of new sites for offshore disposal of dredged material from the port were provided. Presented applications promote the integration of findings of scientific research,

modelling of hydrodynamic conditions and behaviour of disposed mater. Additionally, the principles of MSP while finding the suitable places for beneficial disposal at sea have been applied. The resolution of the Government of the Republic of Lithuania on the Implementation of the Act on Construction of the Republic of Lithuania authorizes, inter alia, the State Spatial Planning and Construction Inspectorate under the Ministry of Environment to issue permits for the construction of new structures and permits for the reconstruction of structures in the territorial waters of the Republic of Lithuania and international waters on its continental shelf to which the Republic of Lithuania has exclusive rights.

5 MSP and ICZM

A relatively small maritime territory of Lithuania accommodates a national marine park which is also a UNESCO World Heritage site, a regional marine park as well as numerous Natura 2000 sites. Article 27 of the Marine Environment Protection Act determines the regulation of activities in the maritime area of the Republic of Lithuania:

1) The protection, use of natural resources and other activities in the maritime territory of the Republic of Lithuania shall be governed by this Act, other laws and acts on environmental impact assessment of the proposed economic activity in the maritime area of Lithuania.
2) Construction and reconstruction of hydrotechnical facilities, wind farms, fish farms, harbours or other infrastructure, excavation, drilling, blasting, seismic surveys, military exercises and other planned activities that may adversely affect the marine environment, can be carried out after the environmental impact assessment (thereinafter referred to as EIA) of the proposed economic activity and in accordance with regulations of other legal acts.

Article 29 of the Marine Environment Protection Act defines the process of establishing marine protected areas (thereinafter referred to as MPAs). MPAs shall be established in accordance with the Protected Areas Act of Lithuania to preserve valuable or characteristic natural complexes, natural habitats or species, animal migration, wintering, seasonal gathering, breeding sites in the maritime area of the Republic of Lithuania. The Coastal Zone Act of the Republic of Lithuania was adopted by the Lithuanian Parliament on July 2, 2002.

Article 1 of the Coastal Zone Act of the Republic of Lithuania defines the objectives for the establishment of the coastal zone, its components, defines the protection and use of the coastal landscape, the conditions for the use of the terrestrial and the marine parts of the coastal zone and the restrictions on economic activities in this territory. Article 4 of the Coastal Zone Act defines the components and delimitation of the coastal zone. The coastal zone shall comprise:

1) a land area not less than 100 m landwards from the coastline of the sea, which includes a foredune, a cliff and a beach extending from the state border of the Republic of Latvia to the northern pier of Klaipeda port;
2) the Curonian Spit as far as the state border with the Russian Federation;
3) Baltic Sea territorial waters of the Republic of Lithuania to the 20 m depth bottom line.

The land and the sea within the coastal zone are an exclusive public property and belongs to the state, except those private lots of land, which have been established before the Act came into force. However, these private lots should not be fragmented for sale, lease, mortgage or any other commercial use. The state has the priority right to buy those lots from the private owners. Integrated coastal zone management (thereinafter referred to as ICZM), according to the Act, is ensured by the following spatial planning documents:

1) Special management plan of Kursiu nerija national park.
2) Special management plan of Pajuris regional park.

3) Special management plan of the mainland coastal zone.
4) Master plans of Klaipeda and Neringa urban municipalities.
5) Detailed plans of urban and rural settlements or parts of settlements within the following municipalities: Neringa, Palanga, Klaipeda urban and Klaipeda rural.

There is no special governmental institution in Lithuania whose task is specifically deal with MSP and ICZM. On the state level integration of MSP and ICZM is ensured by several departments at the Ministry of Environment of the Republic of Lithuania. According to the Coastal Zone Act of the Republic of Lithuania (2002) the objectives of the coastal zone management in Lithuania are the following:

1) To use wisely and to protect landscapes and rare species habitats of the Curonian spit (a World Heritage Site) and the Lithuanian mainland coast of the Baltic Sea.
2) To ensure a sustainable use of the coastal zone for public and state needs.
3) To ensure conservation of coastal nature and culture heritage.
4) To provide favourable conditions for public use of coastal amenities for leisure purposes.

Any new exploitation of underground resources or new construction is fully forbidden within the entire Lithuanian coastal zone. Only reconstruction or regeneration of the existing buildings, or those buildings which are proved to exist in the past, or limited construction of small-scale seaside leisure amenities is allowed within the limits of the coastal zone. A permit for such intervention into the coastal zone can be issued by the Klaipeda Governor's Administration only after the obligatory public hearings and environmental impact assessment. Every permit must be finally approved by the Lithuanian Government (sic!).

Any intervention into the coastal zone must ensure, that there will be no changes in the bottom topography and sediment drift conditions, which might negatively affect neighbouring coastal strips. In order to assess long-term trends and changes in coastal zone development there should be introduced a comprehensive coastal monitoring system. According to the National Coastal Zone Management Programme (2003), which was approved by the Ministry of Environment in September 2003, several important coastal management measures are anticipated, which are aimed to ensure introduction of ICZM principles.

The main ICZM principles as described in the National Coastal Zone Management Programme are:

1) Conservation of natural coastal landscapes and coastal processes.
2) Integration of coastal conservation and coastal use objectives.
3) Littoral cells approach.
4) Differentiation of coastal management measures according to specific priorities for coastal conservation and wise use on a particular coastal strip.
5) Monitoring of coastal development.

It is important to emphasize, that Lithuania is probably the only country in Europe, where the ICZM strategy for the whole seacoast within the national borders is based on a littoral cell approach. For that purpose, the Baltic coastal zone of Lithuania is split into eleven management units and different ICZM measures are applied to various units. In all cases the priority is given to the conservation of natural coastal processes, following the HELCOM Recommendation 16/3 (1995). The most opted coastal protection policy in Lithuania is limited intervention through coastal foredune and forest management, as well as through the submerged nourishment aimed to stabilize the coastal zone, particularly the recreational beaches.

To fight coastal erosion, all forests and foredune ridges of the coastal zone have been classified as protected and preserved. Coastal forests and dunes being the integral part of the coastal belt enjoy protection within the general nature conservation framework (Riepsas 1995; Stauskas 1995). They are,

according to the national Act on Forests, specifically regarded as a protected category. The foredune is regularly maintained and restored after every season of autumn and winter storms. Any new constructions in the coastal zone are allowed only behind the foredune.

Maintenance of coastal foredune and forest plantations (restoration, fastening and revegetation of the foredune with marram grass and hybrid marram grass) is the principal technical coastal stabilization measure. It is a joint responsibility of local municipalities and administrations of Kursiu nerija national park and Pajuris regional park. Application of sand, which is dredged from the Klaipeda Seaport gate for the submerged nourishment of the coastal zone in the nearshore is recommended as an important coastal stabilization measure applied at the mainland Baltic Sea coast.

One of the controversial issues was the removal of an old jetty in Palanga seaside resort in the early 2000s that changed local coastal dynamics and caused erosion of the beach and dunes. This event triggered a broad public debate concerning the ways to restore the lost equilibrium. The programme of regular beach and foreshore nourishment was opposed by an 'anti-programme' of 'hard' shoreline management measures (constructing wave-breakers and new jetties) as providing more robustness for the coastal environment in Palanga.

6 Marine and coastal nature protection

There are two established state parks in the coastal zone of Lithuania covering vast marine areas of the Baltic Sea and designated as MPAs, i.e, protected areas with their own administrations, which are responsible to the State Service of Protected Territories at the national Ministry of Environment: Kursiu nerija national park and Pajuris (Littoral) regional park. They altogether cover app. 30% of the total coastal and maritime territory. The administrations of the state parks in their activity must follow special nature protection plans of these territories, which have to be approved by the national Government.

6.1 Kuršių Nerija National Park

The Curonian Spit is a 98 km long, thin, curved sand-dune spit that separates the Curonian Lagoon from the Baltic Sea coast. Its southern portion lies within Kaliningrad Oblast, Russia and its northern within southwestern Lithuania. It is a UNESCO World Heritage Site shared by the two countries. Kuršių Nerija National Park is one of the five national parks in Lithuania. It was established in 1991 to protect the unique ecosystems of the Curonian Spit and Curonian Lagoon. Kuršių Nerija National Park is protected by the state, under the Lithuanian law of Protected Areas. Since 1997 it is a member of EUROPARC federation. The Park has Category II in the classification of the IUCN.

- English Designation: National Park
- Year of establishment: 1991
- Area km² – 264.64 (97.64 – land, 167 – water)
- IUCN Category – II
- Other designations: UNESCO World Heritage Site, Natura 2000, Baltic Sea MPA (HELCOM MPA)

There are five strips of mobile dunes still remaining on the spit. The mobile dune landscape forms the most distinctive natural heritage value of the Curonian Spit, with the highest mobile dunes exceeding 50 m in height and protected within four strict nature reserves – two within the Russian Kurshskaya Kosa National Park, and two within the Lithuanian Kuršių Nerija National Park. For all the aforementioned reasons, the Curonian Spit is designated as a 'green corridor' within the EU Baltic Sea Regional Programme.

Alas, the policy of forestation which prevailed on the Curonian Spit after the World War II, and particularly throughout 1970s to 1980s, had speeded up degradation, fragmentation and flattening of

the mobile dunes. As a result, the mobile dunes of the Curonian Spit became devoid of any local sand supply sources and rapidly degraded with the scrub and forest succession facilitated by the climate change. Yet, the magnificent vistas over mobile dunes and the Curonian Lagoon still form the most valuable tourism amenities of the southeast Baltic making the Curonian Spit a tourism destination of an international scale.

Every summer the Lithuanian part of the Curonian Spit hosts app. 2 million holiday-makers. However, rapid expansion of tourism facilities is leading to irreversible changes of this area, which has been left almost intact since the collapse of the Soviet Union. Pressures by commercial land use negatively affect the ecological integrity of nature on the spit, thus creating multiple landscape management conflicts. Therefore, the key pre-condition to ensure a truly integrated management of amenities and values of the Curonian Spit is balancing different priorities in the management of mobile dunes, also based on scenic quality assessment.

The conservation priorities of Kuršių nerija National Park are as follows: The national park was established to protect and use sustainably a Lithuanian seaside landscape complex which is the most valuable in natural and cultural terms, including a dune ridge, unique on a European scale, as well as the cultural heritage of the 'dune-dwellers' ('*kopininkai*'). The Outstanding Universal Value of the Curonian Spit as a UNESCO World Heritage cultural landscape reads as follows: it is an outstanding example of a sand dunes landscape reflecting harmonious coexistence of man and nature, featured by numerous and diverse natural and cultural values. It is a cultural landscape created and existing as a result of a continuous interaction of the sea, the wind and humans whose survival can be threatened by irreversible changes.

The list of key marine habitats, communities and species, which enabled to designate Kuršių nerija National Park as a Baltic MPA includes:

Natura 2000 habitats: 2110 Embryonic shifting dunes, 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes'), 2130 Fixed coastal dunes with herbaceous vegetation ('grey dunes'), 2140 Decalcified fixed dunes with *Empetrum nigrum*, 2170 Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*), 2180 Wooded dunes of the Atlantic, Continental and Boreal region, 2190 Humid dune slacks, 2320 Dry sand heaths with *Calluna* and *Empetrum nigrum*.

Endangered plant communities from the Red List of Lithuania: *Juncetum gerardii* Nordhagen 1923, *Carici arenariae-Airetum praecocis* Weshoff et al.1962, *Nymphoidetum peltatea* (Allorge 1922) Bellot 1951, *Hieracio- festucetum arenariae* (Regel 1928), *Zannichellietum palustris* Lang 1967.

List of endangered species listed by HELCOM (Baltic Sea Environment Commission), and their protection status:

- Fish and Lamprey Species. **Critically Endangered:** *Anguilla anguilla*. **Vulnerable:** *Petromyzon marinus, Salmo salar, Salmo trutta*.
- Bird Species (B - breeding, W – wintering). **Critically Endangered:** *Gavia arctica* (W), *Gavia stellate* (W). **Endangered:** *Calidris alpina schinzii* (B), *Clangula hyemalis* (W), *Melanitta nigra* (W), **Vulnerable:** *Melanitta fusca* (W), *Larus fuscus fuscus* (B), *Somateria mollissima* (W).
- Red List of Marine Mammal Species. **Critically Endangered:** *Phocoena phocoena*.

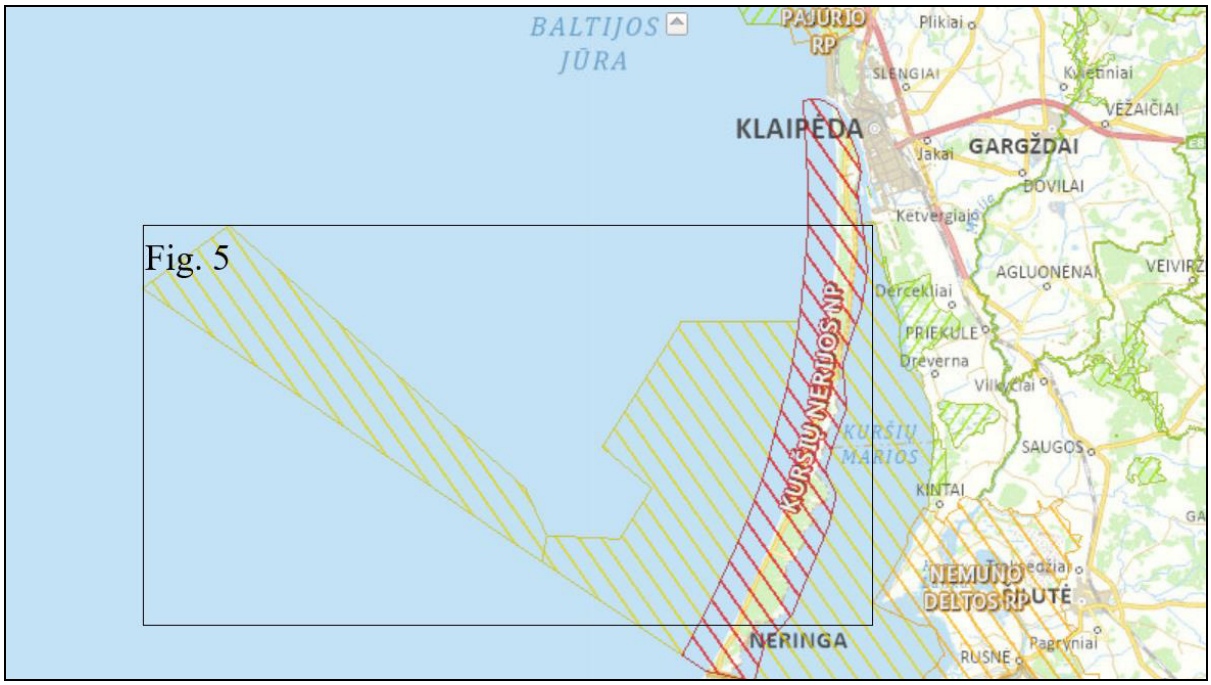

Figure 4: Kuršių nerija National Park (Source: State Service of Protected Territories)

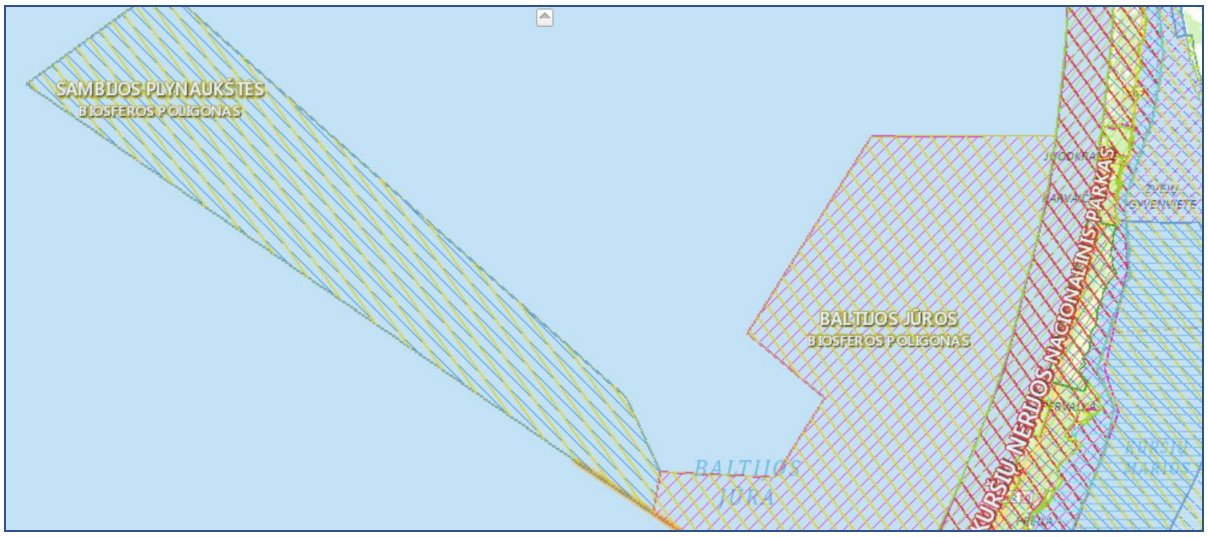

Figure 5: Baltic Sea Biosphere Polygon and Sambian Plateau Biosphere Polygon (Source: State Service of Protected Territories)

6.2 Pajūrio (Littoral) Regional Park

Pajūrio (Littoral) Regional Park of Lithuania is one of 30 regional parks, i.e., IUCN category V protected areas in Lithuania. It is a peri-urban protected area sandwiched between Klaipėda, a city with the busiest seaport on the eastern coast of the Baltic Sea, and Palanga, the largest eastern Baltic seaside resort. The park area comprises 50.3 sq.km of the terrestrial part and 30 sq.km of the maritime part. Pajūrio (Littoral) Regional Park was established in 1992 with the aim to protect natural and cultural assets of the Baltic Sea foreshore and nearshore in Lithuania.

In functional terms, the area of the Littoral Regional Park is divided into a strict reserve zone, a managed reserve zone, a zone of limited economic activity, and a buffer zone where economic activity is permitted albeit within certain limits. The territory of the regional park includes Šaipiai managed nature reserve, Placis strict nature reserve, Karklė marine managed nature reserve, as well as Karklė

ethnographical managed reserve. The administration of the park also manages Klaipėda – Ventspils Plateau Biosphere Polygon (see below).

Pajūris Regional Park boasts a varied seascape on a very short length of the shoreline with parabolic dunes, a 24m high glacial sea bluff, and glacial boulder fields in the nearshore. The terrestrial part of the park area hosts flora and fauna specific for temperate to boreal coastal grasslands. Rare wader and water bird species nest and make migratory stopovers in the Baltic Sea nearshore and the two lakes of the park. The coastal foredune and the parabolic dunes, as well as the grassland behind the dunes are designated as Natura 2000 sites. There are three self-guided nature trails and a bike path crossing the most interesting sites of the park.

- English Designation: Regional Park
- Year of establishment: 1992
- Area km² – 58.65 (27.35 – land, 31.30 – water)
- IUCN Category – V
- Other designations: Natura 2000, Baltic Sea marine protected area (HELCOM MPA)

The conservation priorities of the Littoral Regional Park are as follows: The regional park was established to protect, manage, and use sustainably the landscape, natural ecosystems and cultural heritage values of the Baltic Sea continental coast in Lithuania with an ancient dune ridge, active and ancient sea cliffs, hard offshore bottom habitats, and a traditional fisherman's village centre in Karklė. Another conservation priority is to protect the valuable marine environment of the continental shelf.

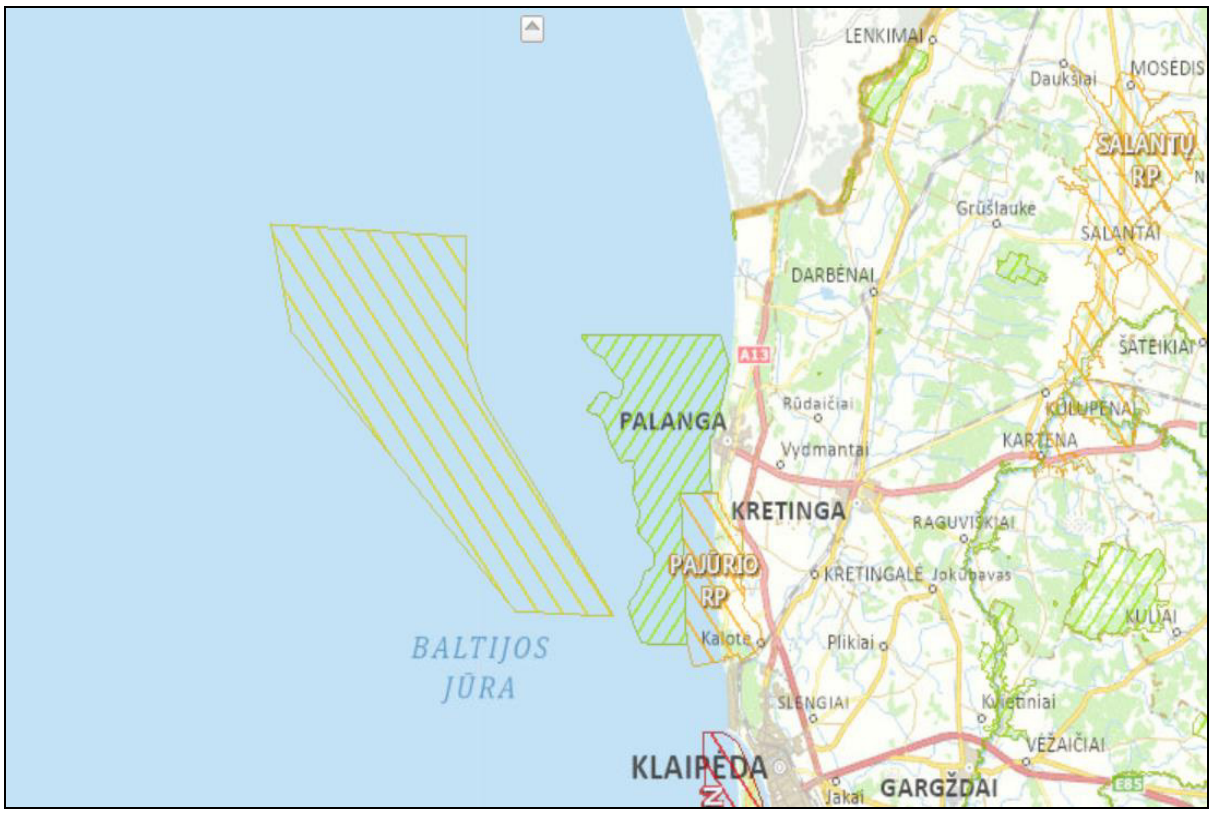

Figure 6: Pajūrio (Littoral) Regional Park (Source: State Service of Protected Territories)

The list of key marine habitats, communities and species, which enabled to designate Pajūrio (Littoral) Regional Park as a Baltic MPA includes:

Natura 2000 habitats: 1170 Reefs, 2110 Embryonic shifting dunes, 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes'), 2130 Fixed coastal dunes with herbaceous vegetation ('grey dunes'), 2140 Decalcified fixed dunes with *Empetrum nigrum*, 2170 Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*), 2180 Wooded dunes of the Atlantic, Continental and Boreal region, 2190 Humid dune slacks, 2320 Dry sand heaths with *Calluna* and *Empetrum nigrum*, **3160 Natural dystrophic lakes,** 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites), 6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*), 91D0 **Bog woodlands,** 9080 Fennoscandian deciduous swamp woods, 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae).

Endangered plant communities from the Red List of Lithuania: *Helictotricho – Filipenduletum vulgaris* Balevičienė 1997; *Airetum praecocis* (Schwickerath 1944) Krausch 1967; *Centunculo – Anthoceretum punctate* W Koch 1926.

List of endangered species listed by HELCOM (Baltic Sea Environment Commission), and their protection status:

- Fish and Lamprey Species. **Critically Endangered:** *Anguilla anguilla*. **Vulnerable:** *Petromyzon marinus, Salmo salar, Salmo trutta*.
- Bird Species (B - breeding, W – wintering). **Critically Endangered:** *Gavia arctica* (W), *Gavia stellate* (W). **Endangered:** *Calidris alpina schinzii* (B), *Clangula hyemalis* (W), *Melanitta nigra* (W), *Polysticta stelleri* (W), **Vulnerable:** *Melanitta fusca* (W), *Larus fuscus fuscus* (B), *Mergus serrator* (W).
- Red List of Marine Mammal Species. **Critically Endangered:** *Phocoena phocoena*.

6.3 Marine Biosphere Polygons

Biosphere polygons or grounds are a very special type of marine protected areas which is available only in Lithuania. These protected areas should not be confused with biosphere reserves. Biosphere grounds or polygons have been established and integrated into the system of protected areas of Lithuania since 2004. Their network is being created as part of a national monitoring system concerned with the state of complex and special biological diversity, and as part of the Natura 2000 series of protected areas on the European Union.

Biosphere polygons facilitate the monitoring, control and forecast of environmental changes in natural systems and the condition of certain species. Almost all biosphere polygons have been established for the protection of bird species of the greatest Community interest in implementing the requirements of the European Union Birds Directive. Therefore, in Natura 2000 terms, these areas are classified as special protected areas for protection of endangered bird species. An English term for the classification of biosphere polygons is 'nature reserve' and the IUCN management category is VI.

There are three marine protected areas designated as biosphere polygons in the Baltic Sea maritime territory of Lithuania: the aforementioned Klaipėda – Ventspils Plateau Biosphere Polygon (established in 2015, area 319.49 km²), the Baltic Sea Biosphere Polygon (established in 2013, area 319.59 km²), as well as Sambian Plateau Biosphere Polygon (established in 2015, area 250.41 km²). These MPAs are established to preserve natural marine habitats of European Community importance (1170 reefs) and to ensure favourable conservation status of endangered wintering waterfowl of European Community importance: the velvet duck (*Melanitta fusca*), the razorbill (*Alca torda*) and the long-tailed duck (*Clangula hyemalis*) at their wintering and migratory sites (Fig. 5).

7 Blue Economy in the Maritime Territory of Lithuania

The relatively small maritime territory of Lithuania accommodates four main navigation routes, the multi-purpose deep-water port of Klaipėda, the oil terminals in Būtingė and Klaipėda, the port of

Šventoji, offshore military training grounds, near-shore fishery bars and offshore fishing areas. Yet, current sustainable development priorities of Blue Economy in Lithuania are first of all related to shipping since the economic role of commercial fisheries is steadily declining. There is also an underwater high voltage electricity link to Sweden (NORDLINK) operating since 2015. Recently, certain areas of the maritime territory of Lithuania have been investigated for OWE development and reserved for sand extraction purposes.

The demand for maritime space in Lithuania increased considerably during past several years. Emerging new maritime uses such as OWE or/and marine aquaculture along with development of new port facilities; underwater electricity cables and underwater oil/gas pipelines concepts; development of liquified natural gas (LNG) market requires comprehensive maritime space planning (MSP) and proper management of the maritime uses. The main marine industry is related to Klaipėda State Seaport and marine cargo handling companies, Klaipėda LNG terminal, Būtingė and Klaipeda oil import-export terminals, Western Shipyard. The Lithuanian marine transport is growing, new sea uses (such us OWE) are emerging and requiring not only proper regulation, space and natural resources, but also having strong pressure on the integrity of the sea floor.

Currently, there are a number of offshore activities that are legally regulated and mapped. These include fishing, navigation, port and wharf activities, nature conservation, military exercises, excavation and dredging of sandy deposits, beach nourishment, developing of engineering infrastructure. These activities arose from the immediate needs of the state, without complex planning. The addition of maritime areas to the Master Plan of the Republic of Lithuania provides that, in order to keep pace with the growth of Blue Economy, the installation of offshore wind farms and corridors for the connection of these parks to terrestrial networks should be envisaged.

In 2012, the Lithuanian Academy of Sciences has conveyed to the European Academies of Sciences Advisory Council (EASAC) several most critical environmental topics to be addressed in the south-eastern Baltic Sea (Lithuanian sector). Those were:

- Marine pollution by biogenic substances (nitrogen, phosphorus) transported from the mainland area – fostering the eutrophication.
- Pollution by oil products, chemical and synthetic materials.
- Impact on marine fauna and flora due to marine transport offshore and in port areas.
- Genetic risks to the fish gene pool related to submerged chemical weapons containing toxic substances (yperite, arsenic) including radionuclides.
- Ecological problems related to insufficient water exchange in and to the Atlantic Ocean.
- Adverse effects to marine benthic fauna and flora caused by introduced invasive species.
- Risks related to increasing extreme atmospheric events such as storms, hurricanes, excess rainfalls, deluges influencing the acceleration of sea level rise, coastal erosion, and degradation of natural sandy beaches.

Along with rapid growth of the maritime activities on a national scale, the fragile Baltic Sea ecosystem needs to be regarded and managed as single entity. This is possible when integrated marine spatial planning is introduced in each Baltic Sea EU Member State. There are key datasets that need to be used while developing the maritime spatial plan. Among those are bottom topography and morphology of the seabed; geological conditions, valuable bottom habitats, nursery and spawning grounds, areas important for wintering birds, hydrodynamic conditions, prospect of mineral resources and, finally, areas already occupied by the existing uses.

Several existing parliamentary acts define the legal framework for the development of Blue Economy in the Baltic Sea maritime territory within the jurisdiction of Lithuania. Article 7 of the aforementioned Coastal Zone Act of the Republic of Lithuania defines the conditions and regulations of construction procedures and permits in the coastal zone, including the territorial waters and the

contiguous zone in accordance with the Act on Construction and the Protected Areas Act and the land use planning documents referred to in the Article 5 of the Coastal Zone Act.

According to all these acts, the following facilities may be located on the coastal zone: facilities for the use of water resources and protection of the environment from the harmful effects of the sea, stabilization of the shoreline, restoration of natural sediment balance and other water management or port needs (dams, quays, breakwaters, embankments, breakwaters, jetties, piers, etc.). During construction in the coastal zone, the developer must ensure that the natural relief of the seabed is not altered and that the balance of sediments is not affected to such an extent as to affect adjacent parts of the coast.

One of the main drivers pushing marine research forward is rapid development of the OWE sector in Europe and the worldwide. Southeast Baltic Sea proves to contain a truly great potential and possibilities for electricity production from the offshore renewable energy sources. Being specific region with good wind conditions and still relatively low intensity of usage of the sea space the southeast sector of the Baltic Sea is an area where considerable growth in the OWE development is expected in the coming 10–20 years.

The demand of renewable energy and high pressure by the investors and researchers being in line with commitments to the EU, ensured that in May 2011 the Renewable Energy Act of the Republic of Lithuania has been approved. Article 5 of the Renewable Energy Act of the Republic of Lithuania implies that the Government of the Republic of Lithuania or its delegated authority must prepare and approve the description of the procedure for issuing permits for the construction and operation of power installations in the territorial sea of the Republic of Lithuania, the EEZ of the Republic of Lithuania in the Baltic Sea and the coastal zone, on the basis of objective and non-discriminatory principles.

Article 16 of the Renewable Energy Act regulates the issuance of permits for the development of electricity production capacity from solar energy on the Curonian Spit and wind energy in the territorial sea of the Republic of Lithuania and the EEZ of the Republic of Lithuania in the Baltic Sea according to the general requirements for the sustainable use of energy resources. The vision to develop OWE has been supported by throughout analysis of the existing legislative system and the existing obstacles for the developments at the sea, stocktaking of existing maritime uses; OWE targets set by the national authorities.

An essential step unlocking the possibilities to switch from the OWE vision to the real implementation was the decision of the Ministry of Environment (in 2012) to extend the spatial solutions of the National Master Plan to the sea. The planning of the Lithuanian maritime territory was the first attempt to integrate the environmental, economic and social needs into a single comprehensive plan. Prepared spatial solutions created the pre conditions for future developments at the sea and at the same time required new quality of the scientific research while investigating the marine resources and evaluating the economic effect as well as environmental consequences.

A special study was conducted in accordance with the Order no. 1-317 of Minister of Energy on December 11th, 2017 “On Research of the Territorial Sea of the Republic of Lithuania, Exclusive Economic Zone of the Republic of Lithuania in the Baltic Sea and other actions necessary for the approval of the procedure for the development and operation of power installations and assessing the capacity at these power installations and the publication of their results for parts of the territorial sea and / or the Exclusive Economic Zone of the Republic of Lithuania in the Baltic Sea.” Selection of the most suitable sites for OWE farms construction was based on certain pre-conditions:

- Sea depth. Assuming that technically reasonable maximum depth is 50 m;
- Wind speed. Modelling data versus real measurements at the pre-selected site;
- Seabed geology. Geological structure of the seabed for optimal choice of foundations for wind towers and cable laying routes;

- Transmission grid. Distance from-to the shore, available substations, capacity of existing/planned power lines;
- Current and planned sea use;
- Existing natural heritage and mineral resources;
- Limitations (reserved zones and areas dangerous for development) for economic activities.

According the above-mentioned conditions, six potential zones suitable for OWE development in the Lithuanian EEZ have been identified (Fig. 7). All six identified areas have been preliminary assessed for impact on the different natural components such as geological conditions, seabed habitats, fishes, birds and related protected areas, visual pollution; and in relation with some of the economic activities such as shipping, fishery, dumping and mineral resources and engineering infrastructure. It is expedient to initiate the creation of an integrated network of offshore wind farms in the Baltic Sea Region, enabling the connection of the wind farms planned in the Baltic Sea region with the EU-funded wind farms of Denmark, Poland, Sweden and Germany considering all potential areas suitable for offshore wind farm projects in a transboundary, comprehensive way.

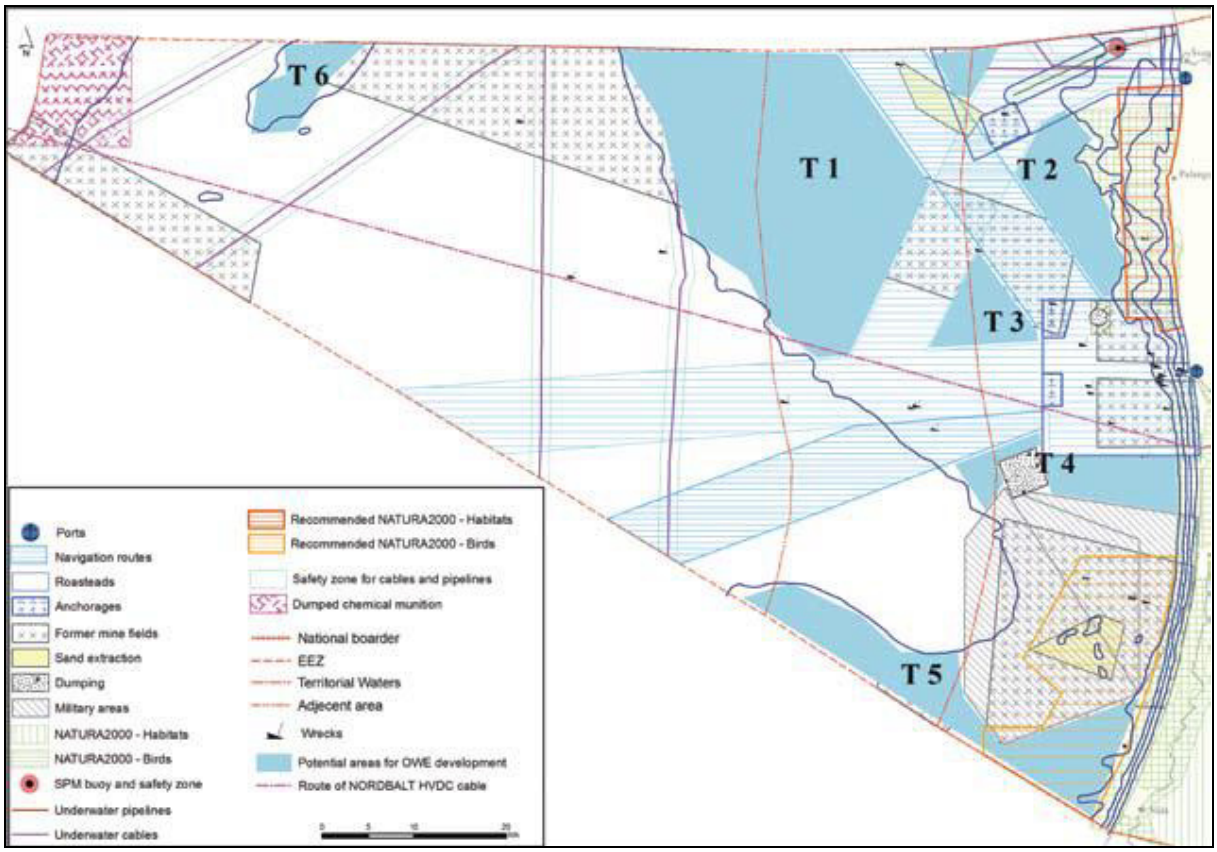

Figure 7: Sea use and potential OWE areas (as for 2013). Source: Blažauskas et al. 2015

The development of wind farms is envisaged in the maritime part of the Master Plan of the Republic of Lithuania at the 20-50 m depth north of Klaipėda. The Klaipėda-Ventspils Plateau and the Klaipėda Bank are recommended as the most suitable sites for offshore wind energy farm development. With the exception of a 3350 MW capacity farm, this maritime area can accommodate the offshore wind farms of any other capacity - from 200 MW to 1600 MW. Some of the areas identified have valid environmental impact assessment (EIA) decisions.

However, it is likely that EIA procedures will need to be repeated due to changed environmental conditions and new provisions of the Environmental Impact Assessment Act. Also, due to the proximity to the Latvian border, the need for a transboundary EIA is likely. It is noteworthy that the environment of the priority areas proposed for the wind farms with total installed capacity of 200, 300, 400, 500, 600, 700, 1000 MW has been investigated during the EIA and it can be expected that the implementation of these wind farms will proceed more smoothly.

Depending on the provisions of the Environmental Protection Agency, it is likely that additional biodiversity surveys will be required in each priority area, updating bat and migratory bird surveys, and bat monitoring. When developing offshore wind farms, it is appropriate to provide for the gradual development of a zone for the development of renewable energy. In the first phase, it is expedient to initiate the emergence of at least two offshore wind farms with the 350 MW capacity each in the EEZ of Lithuania. At a later stage, it could be possible to plan the use of the remaining area for the construction of wind farms, depending on the needs of the state, the development of the electricity network and the activity of investors.

Article 22 of the Renewable Energy Act implies that electricity generation from renewable energy sources in the territorial sea of the Republic of Lithuania, the EEZ of the Republic of Lithuania in the Baltic Sea and the coastal zone has to follow four main legal notions:

1) The Government or its authorized institution shall approve the necessary legal acts regulating the construction and operation of power installations in the territorial sea of the Republic of Lithuania, the EEZ of the Republic of Lithuania and the coastal zone of the Baltic Sea.
2) The maritime territory of the Republic of Lithuania, the EEZ of the Republic of Lithuania in the Baltic Sea and / or the coastal zone shall be used for the construction and operation of power installations only with the permission of the Government or its authorized institution.
3) The permit to use the maritime territory of the Republic of Lithuania, the EEZ of the Republic of Lithuania in the Baltic Sea and / or the coastal zone for the construction and operation of power installations shall be issued by tender. The competition may be initiated by any person meeting the qualification requirements set by the Government or an institution authorized by it by applying to the licensing authority. The competition must be organized by the Government or an institution authorized by it within 3 months.
4) The tender referred to in paragraph 3 shall be organized for the marine area for which a scheme for the construction of power installations in the territorial sea of the Republic of Lithuania, the EEZ of the Republic of Lithuania in the Baltic Sea and / or some of which include spatial planning documents for infrastructure development and environmental impact assessments for power installations.
5) The scheme referred to above was drawn up by 31 December 2013. January 1st approved by the Government. The strategic environmental assessment of the scheme shall be carried out in accordance with the procedure established by the Government.

The deployment of wind farms in areas with high levels of sediment transport can lead to a change in the direction of sediment drift. Wind farms can partially block the sediment drift and slightly disrupt the sand supply to the shadow sections. The installation of offshore wind farms should not affect the sediment dynamics between the shoreline and the offshore area. There are two basic technological methods for laying high-voltage cables on the seabed, either in the trench or by covering the cable laid directly on the seabed with massive concrete overlays of sand or gravel. In both cases, the impact on the seabed and the shore is local and minimal.

In order to ensure a minimal impact on the seabed and sedimentation processes, the most appropriate foundation structures should be selected, taking into account the geotechnical conditions of the seabed. Foundation structures must be resistant to the effects of underwater currents and swell, and must not seriously impede sediment drift. The Baltic Sea is dominated by wind waves, making the wave mode

identical to the wind mode. The largest waves are observed in autumn and winter and the smallest in summer. The average annual wave height on the northern part of the EEZ of Lithuania is about 0.7 m.

While there are no marine mammal populations that might be affected by the construction of the offshore wind farms in the Lithuanian EEZ, the Klaipėda-Ventspils Plateau Biosphere Site was established in the late 1990s. Its main task is to preserve a valuable part of the Baltic Sea ecosystem, in particular to preserve a natural marine habitat of European Community importance (1170 – reefs) and to ensure favourable conservation status of protected wintering waterfowl of European Community importance: the velvet duck (*Melanitta fusca*), the razorbill (*Alca torda*) and the long-tailed duck (*Clangula hyemalis*) at their wintering and migratory sites. These habitats (reefs) occupy about 20 thousand hectares.

From a geomorphological point of view, the most important reefs are moraine ridges with the bottom fauna of *Mytilus edulis* and *Balanus improvisus* which host important forage resources for the endangered waterfowl species. Potential effects of wind turbines on birds include direct collision causing death, disorientation due to lights, particularly in poor weather conditions such as fog. Some birds may also be hit by the air vortexes generated by the rotating blades, as well as by strong winds. However, the migratory birds are known to migrate closer to the coast with the most intense seasonal bird migrations occurring at sea up to several kilometres from the coast.

Several marine fish species have the highest productivity and highest resources in the Lithuanian EEZ of the Baltic Sea. These include herring, sprat, cod and flounder. The shallow coastal waters of the Lithuanian EEZ serve as a very important breeding ground for many juveniles (flounder, halibut, herring, sprat), as well as passerines (smelt, whitefish, fins, capelin, salmon, sea trout) and fake passers (redfish, perch, roach, bream). There are many sprat caviar and larvae found in the waters of the Klaipeda Bank and the Klaipeda-Ventspils Plateau, i.e., in the sites identified as the most suitable for the offshore wind farms. About 20% of the sprat biomass in the eastern Baltic is found in the Lithuanian EEZ.

It is also important to note that the Lithuanian EEZ is located at the northern limit of the cod distribution in the Baltic Sea. Water turbidity will increase substantially, although temporarily, during the period of construction of the offshore wind farms and afterwards. Because of this the fish in the larval or juvenile stages may be affected. Furthermore, part of the benthic habitats used to search for food by benthic fish can be destroyed by laying wind farm foundations. On the other hand, the growth of hard-bottom organisms in the park areas due to the emergence of new suitable habitat substrates is also predicted. It could positively affect fish populations through the proliferation of potential food items and the creation of spawning habitats.

Shipping routes and ports that might have conflicting interests with the planned offshore wind farms in the northern part of the Lithuanian EEZ include two main shipping routes which are used most intensively in the Lithuanian Sea Region: it is a navigation line to / from the Klaipeda port and to / from the Butinge oil terminal. Every year 7000-8000 ships visit Klaipeda port while at the Butinge Oil Terminal only tankers are serviced, their number is small compared to the number of tankers arriving to Klaipeda port and it is about 90-100 vessels per year. The Maritime Safety Act sets out measures and restrictions on the safe navigation of waterways. Construction works that interfere with safe navigation on public waterways are prohibited.

Except of the pipeline connecting the Butinge terminal offshore buoy with the land reservoirs, there is no other submarine infrastructure in the planned area of the offshore wind farms. However, there are four cables crossing the Lithuanian EEZ from south to north and southwest to northeast, which are marked on the navigation maps, but their origin is unknown.

The protection of underwater heritage is regulated by the UNESCO Convention for the Protection of Underwater Cultural Heritage which was ratified by Lithuania in 2006. There are several sunken ships in the planned area of the offshore wind farms. There are also several valuable underwater cultural landscape areas with natural relics and tree remains.

In Lithuanian territorial waters and the EEZ of the Baltic Sea, a limited area is occupied by restricted areas: training grounds used by the military, an area with drowned World War II munitions, and former minefields. There is no restriction on shipping in the offshore military exercise areas, but all activities in these areas must be coordinated with the Ministry of National Defence and the Maritime Administration.

According to historical data sources, the World War II munitions dumped at sea within the Lithuanian EEZ have been identified as dangerous. Former minefields have been identified as potentially dangerous. Economic activities in these areas are possible, but it is a prerequisite to carry out detailed surveys of the bottom during the development phase of the projects in search of dangerous objects and, if necessary, to decontaminate them.

8 Conclusion

For many years, strategic planning documents in Lithuania did not address maritime activities and were more land-oriented. There were no strategic objectives and / or action plans for the efficient use of marine natural resources; there was no licensing procedure for offshore oil exploitation. Strategies lacked intersectoral coordination / planning: port / transport; use of protected areas - renewable energy sources; energy projects - nature protection while land-sea integration was rather poorly expressed. However, in the early 2010s the situation has started to change and the Klaipeda County Master Plan's ambition to address maritime activities was the first attempt to evaluate the development of Blue Economy in the only maritime county of Lithuania in a comprehensive way.

MSP in Lithuania is included into the national legislation regulating spatial planning, namely the revised Spatial Planning Act (2013) which includes stipulations on maritime territory planning and its secondary legal acts. Based on the stipulations of national legal acts, Lithuanian marine territories were planned while extending the existing Master Plan of the Territory of the Republic of Lithuania by one more part – Marine territories, which included marine spatial solutions for the Lithuanian territorial waters and the EEZ.

The part ‘Maritime territories’ of the Master Plan of the Republic of Lithuania, that complements the terrestrial spatial planning, was adopted by the Parliament of the Republic of Lithuania in 2015. The extension of the Master Plan of Lithuania to the maritime territory was the first attempt to integrate the marine related data and spatial solutions in an integrated and comprehensive way. The main goals of this comprehensive planning effort in the maritime territory of Lithuania were:

- to maintain a balance between economic development and environmental protection and to enable integrated solutions to the challenges in the proposed area;
- to reconcile interests regarding the conditions for the use and development of the maritime area and the rights of subjects of international law;
- to form a coherent policy for the development of Blue Economy;
- preserving, rational use and restoration of natural resources, natural and cultural heritage values, including recreational resources;
- reserve (designate) areas for the development of infrastructure and other areas of activity, different types of offshore development.

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Maritime Spatial Planning in the South Baltic Area

1 Introduction

Maritime Spatial Planning (MSP) is defined in the Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a European-wide framework for MSP. The process of MSP is defined as 'a process by which the relevant Member State's authorities analyse and organise human activities in marine areas to achieve ecological, economic and social objectives', according to the European Commission's Directive on MSP. In practice, MSP has been considered world-wide even in a broader way as encompassing both formal and informal public undertakings and initiatives on how to use the sea space in line with societally agreed goals, values and targets.

MSP is part of the overarching Integrated Maritime Policy (IMP) of the EU, which seeks to provide a more coherent approach to maritime issues, with increased coordination between different policy areas. It focuses on:

- issues that do not fall under a single sector-based policy e.g. 'Blue growth' (economic growth based on different maritime sectors);
- issues that require the coordination of different sectors and actors e.g. marine knowledge.

Specifically, the IMP of the EU covers these cross-cutting policies:

- Blue growth.
- Marine data and knowledge.
- MSP.
- Integrated maritime surveillance.
- Sea basin strategies.

It seeks to coordinate, not to replace policies on specific maritime sectors. The need of the EU for the IMP relies on several interrelated reasons. It is necessary:

- To take account of the inter-connectedness of industries and human activities centred on the sea. For instance, an offshore wind farm may disrupt shipping, which in turn will affect ports.
- To save time and money by encouraging authorities to share data across policy fields and to co-operate rather than working separately on different aspects of the same problem.
- To build up close cooperation between decision-makers in the different sectors at all levels of government – national maritime authorities, regional and local authorities, and international authorities, both inside and outside Europe. Many countries are recognising this need and move towards more structured and systematic collaboration.

Key benefits of MSP for the EU include:

- **Reduction of conflicts** between sectors and creation of synergies between different activities.
- **Encouragement of investments** by creating predictability, transparency and clearer rules.
- **Increased cross-border** cooperation between EU countries to develop energy grids, shipping lanes, pipelines, submarine cables and other activities, but also to develop coherent networks of protected areas.
- **Protection and preservation of the environment** through early identification of impact and opportunities for multiple use of space.

In addition, there are many indirect benefits including those flowing from systematic data and information collection and stakeholder processes, for instance. Outside of the European realm, and also in the scientific community, MSP is sometimes referred to as marine (instead of maritime) spatial planning.

The EU MSP Directive lists several minimum requirements for maritime spatial plans, including reference to aspects such as:

- land-sea interactions;
- the ecosystem-based approach;
- coherence between MSP and other processes such as integrated coastal management;
- the involvement of stakeholders;
- the use of best available data;
- transboundary cooperation between Member States;
- and cooperation with third countries, which is particularly pertinent for the current Chapter.

2 MSP as an international process

According to the EU MSP Directive, 'MSP should cover the full cycle of problems and opportunity identification, information collection, planning, decision-making, implementation, revision or updating, and the monitoring of implementation'. Common approaches to MSP follow a cycle or stepwise approach, such as proposed in the PlanCoast Handbook on integrated MSP, or the 'Step-by-step Approach for MSP towards Ecosystem-based Management' developed by UNESCO. Almost all European countries have developed MSP along a cyclic process and adapted them to their own needs. Generally, the main steps of an MSP process include: organisation of the process and the involvement of stakeholders, the development of a vision and objectives.

The next steps include a stocktaking and analysis of existing conditions, an analysis of future conditions and existing and potential conflicts, the development of solutions, followed by the drafting, implementation, evaluation and adaptation of the plan and the planning process. In Europe, the 23 coastal Member States are obliged under the MSP Directive to develop a national maritime spatial plan at the latest by 31 March 2021, with a minimum review period of 10 years. The MSP Directive was adopted in 2014 and establishes a framework for MSP, *'aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources.'*

Across Europe, Member States are currently in different phases of the MSP process, with plans either in preparation, adopted or in review.

In order to foster the knowledge creation on how to design and conduct MSPs, including the institutional arrangements and the allocation of maritime activities, many projects have been deployed or are on-going within Europe. A great majority of these projects are funded via various EU funding programmes and are often also of transnational nature by bringing the experience together from various partners across Europe or one specific sea-basin and/or region. The ambition is not only to achieve experience exchange, transfer and knowledge creation, but also to foster coherence among the various MSP attempts within one sea-basin.

The Marine Strategy Framework Directive aims to achieve Good Environmental Status (GES) of the EU's marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend. Annex III of the Marine Strategy Framework Directive was amended in 2017. The document, which has a complicated name "*Commission Directive (EU) 2017/845 of 17 May 2017 amending Directive 2008/56/EC of the European Parliament and of the Council as regards the indicative lists of elements to be taken into account for the preparation of marine strategies"* is aimed to better link ecosystem components, anthropogenic pressures and impacts on the marine environment with the MSFD's 11 descriptors and with the new Decision on Good Environmental Status.

The Marine Strategy Framework Directive is the first EU legislative instrument related to the protection of marine biodiversity, as it contains the explicit regulatory objective that 'biodiversity is

maintained by 2020', as the cornerstone for achieving GES. In order to achieve its goal, the Directive establishes European marine regions and sub-regions on the basis of geographical and environmental criteria. A Marine Strategy includes:

- The initial assessment of the current environmental status of national marine waters and the environmental impact and socio-economic analysis of human activities in these waters.
- The determination of what GES means for national marine waters.
- The establishment of environmental targets and associated indicators to achieve GES by 2020.
- The establishment of a monitoring programme for the ongoing assessment and the regular update of targets.
- The development of a programme of measures designed to achieve or maintain GES by 2020 The process is cyclical and the second cycle starts again in 2018.

Cooperation between the Member States of one marine region and with neighbouring countries which share the same marine waters, is already taking place through these Regional Sea Conventions. It is especially important since climate change is speeding up. Climate change is already affecting the marine environment and will continue to trigger changes in biological, chemical and physical processes. Such changes can reduce the 'ecosystem resilience' (i.e. the ability of an ecosystem to persist despite disruption and change) to other man-induced pressures, leaving ecosystems increasingly sensitive to disruption. Impacts include rising sea levels, increased sea temperatures, precipitation changes, and ocean acidification.

Although some of the likely impacts of climate change in marine and coastal regions can be anticipated, the extent and location of these impacts is more difficult to predict with any certainty. Little is known for example about the effect of ocean acidification on carbon sequestration and consequential effects on marine food-web and ecosystems. Marine strategies in some coastal areas of the EU Member States will need to identify ways of adapting to the effects of global warming and to reduce the vulnerability of natural and human systems to climate change effects.

The sustainable marine governance of the Baltic Sea region constitutes a strategic interest for the EU and it is in this context obvious the strong need to rely on a common framework at EU level to support the cooperation between the EU Member States in the MSP. This indeed is also the perspective adopted by the Directive 2014/89/EU, which, in Article 11, encourages the cooperation in the framework of specific strategies for sea basins, such as the EU Strategy for the Baltic Sea Region. This Strategy is being realized and implemented relying on the Communication of the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions concerning the European Union Strategy for the Baltic Sea Region, (COM/2009/248 final).

It is also important to ensure a certain degree of consistency in planning terrestrial and maritime space, including for the management of the specific area of transition between land and sea represented by the coastal areas and in this perspective, ICZM is of utmost relevance forming the 'link' between maritime and terrestrial development. The European Commission had initially proposed the adoption of a single Directive on both MSP and ICZM. Actually, the Directive 2014/89/EU, which refers exclusively to the MSP, contains a simple and mere reference to ICZM, calling on the EU Member States to promote coherence between the two processes, as a result of compromises with the demands from several Member States.

3 EU collaboration with Russian Federation on marine issues

3.1 General Principles

According to the EU MSP Directive (2014), 'Member States should consult and coordinate their plans with the relevant Member States and should cooperate with third-country authorities in the marine

region concerned in conformity with the rights and obligations of those Member States and of the third countries concerned under Union and international law. Effective cross-border cooperation between Member States and with neighbouring third countries requires that the competent authorities in each Member State be identified. Member States therefore need to designate the competent authority or authorities responsible for the implementation of this Directive.'

Given the differences between various marine regions or sub-regions and coastal zones, European Commission didn't consider it appropriate to prescribe in detail in the Directive the form which those cooperation mechanisms should take. Furthermore, Article 6 of the Directive implies that to meet minimum requirements for MSP Member States shall establish procedural steps to contribute to the objectives listed in Article 5, taking into account relevant activities and uses in marine waters. In doing so, Member States shall, *inter alia,* promote cooperation with third countries in accordance with Article 12. Article 12 of the EU MSP Directive briefly defines the essential basic framework for cooperation with third (neighbouring non-member) countries.

According to Article 12, EU Member States shall 'endeavour, where possible, to cooperate with third countries on their actions with regard to maritime spatial planning in the relevant marine regions and in accordance with international law and conventions, such as by using existing international forums or regional institutional cooperation.' The implementation of Article 12 strongly relies on implementation of the Integrated Maritime Policy of the EU and is based on the Communication of the European Commission from 15 October 2009 – Developing the international dimension of the Integrated Maritime Policy of the European Union (COM (2009) 536 final).

In this Communication, the European Commission describes its strategy to strengthen its authority in multilateral and bilateral relations in the domain of maritime affairs. This strategy should allow the European Union (EU) to exercise greater influence over international debate on marine issues in order to safeguard its economic and social interests and increase protection of the environment. It should also contribute to sustainable maritime governance at global level. This strategy covers a number of domains (for example the protection of marine biodiversity, climate change, maritime safety and security, working conditions on board ships and research into the marine environment) which necessitate international and integrated solutions.

In order to improve global governance of seas and oceans, the EU must in particular:

- strengthen its role as a global player through greater and more unified participation in multilateral fora;
- promote membership of the UN Convention on the Law of the Sea (UNCLOS) at global level;
- establish high-level dialogues on maritime affairs with key partners, ensuring synergies with existing sectoral dialogues in other policy areas;
- pursue dialogue on Integrated Maritime Policy (IMP) bilaterally through both European Neighbourhood Policy instruments and multilateral dialogue. Dialogue on IMP may be based on the frameworks put in place at sea-basin-level (e.g. Union for the Mediterranean, Northern Dimension, Black Sea Synergy). It can be supplemented by sharing best practices concerning the implementation of IMP instruments with countries neighbouring the EU and by encouraging these countries to use the instruments;
- continue to work on moving oceans and coasts higher up the climate change agenda and provide assistance to developing coastal and island states in this field, in line with the EU development cooperation strategies and initiatives;
- continue to support an integrated approach to the conservation and sustainable use of marine biodiversity, particularly in areas beyond national jurisdiction, including for the establishment of marine protected areas;
- pursue its cooperation with the third countries to encourage decent working conditions in the maritime sector;

- pursue its actions to ensure freedom, safety and security of navigation, including actions against piracy;
- continue and strengthen cooperation in research activities with third countries in order to enhance participation in large-scale international research programmes and with countries neighbouring the EU in order to define common regional marine research strategies;
- ensure coherence between the activities of various organisations, notably in the fisheries, environment and transport fields;
- encourage the UN to develop a structure for exchange of best practices on integrated approaches to maritime affairs;
- develop strategies for all relevant shared sea basins.

Actually, the Communication of the European Commission from 15 October 2009 - Developing the international dimension of the IMP of the European Union is also very much relevant for the EU Marine Strategy Framework Directive (MSFD, 2008). This directive considers regional cooperation as one of the key instruments to achieve the good status of marine environment on a broader scale. According to the MSFD, 'regional cooperation' means 'cooperation and coordination of activities between Member States and, whenever possible, third countries sharing the same marine region or subregion, for the purpose of developing and implementing marine strategies.'

The MSFD further notes, that: 'In order to achieve the coordination referred to in Article 5(2), Member States shall, where practical and appropriate, use existing regional institutional cooperation structures, including those under Regional Sea Conventions, covering that marine region or subregion. For the purpose of establishing and implementing marine strategies, Member States shall, within each marine region or subregion, make every effort, using relevant international forums, including mechanisms and structures of Regional Sea Conventions, to coordinate their actions with third countries having sovereignty or jurisdiction over waters in the same marine region or subregion.'

In the context of regional cooperation, Member States shall build upon relevant existing programmes and activities stemming from international agreements such as Regional Sea Conventions. Paragraph 13 of the Directive explicitly states that: 'By reason of the transboundary nature of the marine environment, Member States should cooperate to ensure the coordinated development of marine strategies for each marine region or subregion. Since marine regions or subregions are shared both with other Member States and with third countries, Member States should make every effort to ensure close coordination with all Member States and third countries concerned.'

Indeed, where practical and appropriate, existing institutional structures established in marine regions or subregions, in particular Regional Sea Conventions, for example Helsinki Convention, should be used to ensure close coordination between the EU Member States and the third countries (e.g. Russian Federation in the Baltic Sea) with waters in the same marine region or subregion as a Member State. In such case, the third country concerned should be invited to participate in the process laid down in the MSFD, thereby facilitating achievement of good environmental status (GES) in the marine region or subregion concerned.

The MSFD further notes in paragraph 21, that: 'It is crucial for the achievement of the objectives of this Directive to ensure the integration of conservation objectives, management measures and monitoring and assessment activities set up for spatial protection measures such as special areas of conservation, special protection areas or marine protected areas.' In this way, the achievement of GES becomes a coherent and comprehensive objective and collaboration milestone for all the countries– all eight EU Member States and Russian Federation – sharing the marine basin of the Baltic Sea.

3.2 MSP and the Russian Federation

The EU is leading the development on Maritime Spatial Planning worldwide: 46% of all MSP initiatives take place in the EU. In order to broaden the experience of cross-border cooperation and to

promote spatial planning at a global level, the Commission has undertaken a study on international best practices and the development of an inventory of practices worldwide (to be published May 2017). Following the jointly organised 2nd International Conference on Marine/Maritime spatial planning in March 2017, the Commission's Directorate General for Maritime Affairs and Fisheries and the Intergovernmental Oceanographic Commission of UNESCO adopted a 'Joint Roadmap to accelerate Maritime/Marine Spatial Planning processes worldwide'.

The roadmap identifies common challenges and proposals for actions to be implemented in the coming years, reaching out for collaboration with other UN bodies and Member States. The Commission will work with all relevant actors to develop proposals for internationally accepted guidelines in order to promote the use of MSP and related processes by partner countries and at international level, in particular in the UN. For this aim, the European Neighbourhood Policy (ENP) provides a tangible financial and institutional instrument to involve the countries sharing with the EU the marine basins – the Baltic Sea, the North Sea, the Mediterranean Sea, the Adriatic Sea and the Black Sea.

The ENP is a foreign relations instrument of the EU which seeks to tie those countries to the east and south of the European territory of the EU to the Union. These countries, primarily developing countries, include some who seek to one day become either a member state of the European Union, or more closely integrated with the European Union. The ENP aims at bringing Europe and its neighbours closer. It does not apply to neighbours of the EU's outermost regions, specifically France's territories in South America, but only to those countries close to EU member states' territories in mainland Europe.

The EU offers financial assistance to countries within the ENP, so long as they meet the strict conditions of government reform, economic reform and other issues surrounding positive transformation. This process is normally underpinned by an Action Plan, as agreed by both Brussels and the target country. The EU typically concludes Association Agreements in exchange for commitments to political, economic, trade, or human rights reform in a country. In exchange, the country may be offered tariff-free access to some or all EU markets (industrial goods, agricultural products, etc.), and financial or technical assistance. Association Agreements have to be ratified by all the EU member states.

It was conceived after the 2004 enlargement of the European Union with 10 new member countries, in order to avoid creating new borders in Europe. It is also designed to prevent the emergence of new dividing lines between the enlarged EU and its neighbours. The vision is that of a ring of countries, drawn into further integration, but without necessarily becoming full members of the European Union. The policy was first outlined by the European Commission in March 2003. The countries currently covered by the ENP include Algeria, Morocco, Egypt, Israel, Jordan, Lebanon, Libya, Palestine, Syria, Tunisia in the South and Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine in the East.

Russia has a special status with the EU-Russia Common Spaces Policy instead of ENP. In practice there are no substantial differences (besides naming) between the sum of these agreements and the ENP Action Plans (adopted jointly by the EU and its ENP partner states). In both cases the final agreement is based on provisions from the EU law and is jointly discussed and adopted. For this reason, the Common Spaces receive funding from the European Neighbourhood and Partnership Instrument, which also funds the ENP. The latest EU-Russia strategic partnership was signed in 2011, however, a closer collaboration between the EU and Russian Federation was later challenged by the European Parliament in 2015 following the annexation of Crimea and the war in Ukraine.

Yet, Russia and the EU continue to work together under the 8th Framework Programme for Research and Technological Development, also called Framework Programme Horizon 2020, which runs from 2014 to 2020. It is very much anticipated, that the established close scientific cooperation with Russia, including that on marine environment, will continue also in the next programming period. As mentioned, the EU is committed to pursue its efforts to improve dialogue with its neighbours, at both bilateral and regional level, including by concluding Regional Seas Conventions. This long-term

commitment is also pertinent in the case of Russian Federation regardless the level of political and military tensions.

3.3 EU Baltic Sea Region Strategy and Russian Federation

Regional approaches have already been launched for the Mediterranean Sea, the Arctic Ocean, and the Baltic Sea. The preparation of similar approaches for other sea basins is now of paramount importance. The EU can thus contribute to extending Integrated Maritime Policy at global level. The EU macro-regional strategies cover almost 2/3 of the Union, and represent new and experimental multi-level governance. The idea for macro-regional strategies sparked from realising that similar challenges and possibilities are often dictated by the geographical and cultural area. Countries in the same region can address these better through increased cooperation generated by the strategies.

Working together across the EU borders with the neighbouring countries is in the core of macro-regional strategies. Enhanced cooperation improves greatly the everyday lives of people living in the area as macro-regional strategies cover several topics ranging from education, health and environmental protection to innovation, transport and tourism. Each macro-regional strategy is characterized by its surroundings. For the EU Strategy for the Baltic Sea Region (EUSBSR), it is the Baltic Sea that connects and inspires people around it to work together. The main fields of work in the EUSBSR are thus closely linked to the sea.

The Action Plan for the EU Strategy for the Baltic Sea Region reflects the three overall objectives of the EUSBSR. The Action Plan comprises 13 Policy Areas and 4 Horizontal Actions, which represent the main areas where the EUSBSR can contribute to improvements, either by tackling the main challenges or by seizing key opportunities of the region. Typically, Member State(s) coordinate(s) each Policy Area or Horizontal Action, and they work on its implementation in close contact with the Commission and all stakeholders, i.e. other Member States, regional and local authorities, inter-governmental and non-governmental bodies. Other bodies may also be nominated to coordinate an area or action. They need to ensure that the Action Plan is consistent with all EU policies.

The three objectives of the Strategy are Save the sea; Increase prosperity and Connect the region. The main task of Horizontal Action Neighbours within the three objectives is to bring stakeholders in the European Union member states and neighbouring countries, North Western territories of the Russian Federation as well as Norway, Belarus and Iceland together in a constructive, mutually advantageous manner. The EUSBSR is concretely put into practice in joint multilateral or transboundary collaboration projects. This is what links macro-regional strategies closely to the EU Cohesion policy as most of the joint projects implementing EUSBSR are funded from the cohesion policy funds.

As the strategies encourage countries to work together, they contribute particularly to the cooperation dimension of EU Cohesion policy. Strong territorial cooperation has a positive impact on economic, social and territorial cohesion. Strategies involve actors from all levels of society to work towards a more prosperous region. They also bring the EU closer to citizens through concrete EU funded projects that engage and have a positive impact on our lives. Strong and prosperous macro-regions can therefore foster the development of European democracy and EU's values, particularly in times when Europe is facing several challenges.

One example of the importance of macro-regional strategies is their links to countries outside the EU. The EUSBSR consists of eight EU member countries and in addition four neighbouring countries (Belarus, Iceland, Norway and Russia). Hence, the Baltic Sea region has roughly 90 million people living in 8 EU countries and 4 four non-EU countries when defined both by drainage basin and economical inter-connections. But it is not particularly revealing to just look at cooperation based on countries. As the Strategy works actively with non-EU member countries on regional level, it strengthens their links with the European Union, too. In the BSR, the sea is a natural ground for co-operating beyond the EU borders.

4 Interaction between Poland, Lithuania and Russia in MSP

4.1 Southeast Baltic transboundary region: socio-economic features

Around half of the population of the Southeast Baltic region lives in the coastal zone. Since the mid-1990s, though, regional trends in the number of people living at the coast have varied considerably. Kaliningrad Oblast in Russia has seen a net gain of 8.2 % whereas there has been no change in Pomorskie Voivodeship in Poland and a net loss of four % in Klaipeda County in Lithuania. The proportion of people living at the coast is somewhat higher at 60 % in both Kaliningrad Oblast and Klaipeda County and lower at 40 % in Pomorskie Voivodeship.

Average population density in the Southeast Baltic coastal zone as a whole is around 330 persons / km^2 but there are considerable differences between sub-regions. Density is greatest in the coastal zone in Lithuania at 446 persons per square kilometre followed by the zone in Pomorskie Voivodeship at 304 persons / km^2 and the zone in Kaliningrad Oblast at 255 persons / km^2. There are considerable differences as well between coastal and non-coastal districts. In Klaipeda County, there are just over twelve people living at the coast for every one person who lives in non-coastal districts. In Kaliningrad Oblast, the ratio is 7.5:1 whereas in Pomorskie Voivodeship it is 5.3:1.

More pronounced than the differences between coast and hinterland are those within the coastal zone itself. Fig. 4 shows that the coastal population is concentrated in and around a few large urban areas, i.e. Gdynia, Sopot, Gdansk, Kaliningrad and Klaipeda. The border areas between Russia and Poland in the south of the Vistula Lagoon and between Russia and Lithuania in the north of the Curonian Lagoon are relatively sparsely populated. So, too, is the coastal strip in Pomorskie west of Wladyslawowo. In all three locations, average population density rarely exceeds 20 persons per km^2.

We might have expected a shift in population over the past ten years or so from the interior of all three regions to the coast to take advantage of urban services, educational opportunities, recreational facilities and employment. This appears to be happening but the trends are by no means clear. Lithuania has experienced an absolute decline of 5.8 % in its national population since 1996 as its citizens have taken advantage of membership of the European Union and sought jobs and training abroad. Somewhat surprisingly, during the earlier period total population loss was relatively greater in the coastal municipalities of Klaipeda County.

The total population loss was greater in the coastal municipalities of Klaipeda County even than in the county's non-coastal districts although both recorded an equal loss of 1.4 % in the last decade. The population of the coastal districts of Pomorskie Voivodeship registered an increase of just 0.1 % between 1995 and 2006. Kaliningrad Oblast registered a net population gain of 7.5 % between 1989 and 2005; unlike in Klaipeda County, the increase in Kaliningrad was greatest in the coastal zone at 8.2 % compared to 6.5 % in non-coastal districts.

Political, economic and social upheavals over the past two decades in the Southeast Baltic have disrupted any long-term trends in the size and distribution of the population that might have existed beforehand and it would be rash to speculate too closely about what might happen next. Net loss of population since the late 1980s has been reversed in Kaliningrad Oblast but it is still apparent in Klaipeda County. There is some evidence that an increasing number of the young people who quit Poland for the west following enlargement of the EU in 2004 are beginning to return home.

Also, in Lithuania, an increasing number of the young people who quit the country for the west following enlargement of the EU in 2004 are beginning to return home. Hence this trend is steadily growing and is mirrored in both EU countries. And there is an increasing trend that the coast is a preferred destination. All that we can say at present is that population pressure on the coast is muted but if demand for a coastal location does increase substantially, then densities would almost certainly rise (along with the price of land) because a significant proportion of land at the coast is protected from further development for reasons of nature conservation and landscape quality.

Recreational sailing and boating have a long history in the Southeast Baltic but the construction of purpose-built marinas is a comparatively recent phenomenon. The number of berths and moorings, and the amount of dry rack storage space, has increased in both Pomorskie Voivodeship and Klaipeda County, perhaps by as much as one fifth, since 1995. It is probable that the number of moorings has grown also in Kaliningrad Oblast but confirmatory figures are not available. In Lithuania and Kaliningrad Oblast the greatest amount of activity takes place within the lagoons and adjacent river systems. Only in Poland do a significant number of boats sail from ports and harbours located on the open coast (Fig. 6).

The potential for a major expansion in boating activity is considerable. Indeed, a number of locations have already outlined plans for an increase in both berths and moorings. Rather like traffic on shore, an integrated strategy for guiding maritime development throughout the Southeast Baltic is desirable. Recreational boating is one of the fastest-growing leisure activities in coastal areas. It is regarded as benign, providing much-needed tourist income while causing little environmental damage. To a significant degree, this is true. Sailors require little more than a slipway from which to launch their craft, somewhere to park a vehicle, perhaps a swinging mooring in the middle of an estuary or a space to tie-up against a harbour wall.

Assuming waste oil and other debris is not thrown overboard, and that sailors respect protected areas, boating has few significant environmental impacts. Greater impacts may derive from power boating and personalised water craft such as jet skis. These can cause serious damage to the banks of vulnerable rivers and estuaries; at sea they are both noisy and a potential danger to other water users. However, zoning coupled with awareness-raising campaigns have proved effective in minimising their impact. Marinas have the greatest potential to impact on coastal areas. This is not only because of the building of the marina itself.

The potential of marinas to impact on coastal areas is large because construction costs are often cross-subsidised by the associated development of housing, hotels, restaurants, shops and other tourist services which in turn require road access, parking places, water and waste disposal facilities, and so on. Monitoring the growth rate in demand for berths should help harbour commissioners, and local and regional planning authorities, to assess the cumulative impact of further developments on an ongoing basis as well as identifying 'hot spots' where local carrying capacity will be exceeded. Berths are permanent, sheltered anchorages where boats are tied to fixed or floating walkways or pontoons attached to pilings anchored to the ground beneath the water.

Moorings are simply floating buoys attached to the sea bed or the shore to which boats are tied; or spaces in an estuary or harbour where boats can ride at anchor. The number of moorings exceeds the number of berths by approximately 4.5:1 in both Klaipeda County and Pomorskie Voivodeship. Where there is restricted space for providing berths at sea, marinas have developed on-shore rack storage facilities where boats can be lifted by crane into a 'boat park'. The more sophisticated storage systems are electronically-controlled and can house over one thousand boats. Rack storage is virtually absent from Klaipeda County and Kaliningrad Oblast but Pomorskie Voivodeship has seen a number of systems introduced in recent years (Fig. 6).

The number of marinas and berths during the past decade has almost doubled in Pomorskie Voivodeship where an additional 700 berths have been provided at both existing and newly-built marinas. The greatest concentration of facilities, as we would expect, are in the biggest population centres of Gdynia and Gdansk although the recently-completed marina at Leba boasts 120 berths, attracting sailors not only from Poland but also from Germany and Sweden. The growth of recreational boating in Klaipeda County was slower than in Poland; nevertheless, recent years have seen updated facilities introduced at a number of ports and harbours.

Roughly 600 berths are available at fifteen locations within the Curonian Lagoon, the highest concentration being in Klaipeda: Old Castle Marina and the Smiltyne Yacht Club can host 250 and 115 boats respectively. There are no marinas as such in Kaliningrad Oblast and thus only a handful of

berths. However, moorings are relatively common in the northern part of the Vistula Lagoon and at the mouth of the Deyma river. Blue Flags were conferred on four marinas in the Southeast Baltic – Gdansk, Gdynia and Leba in Poland, and Minija in Lithuania. (The award of a Blue Flag marina is based on compliance with 23 criteria covering aspects of environmental education and information, environmental management, safety and services, and water quality.

Maritime tourism is an important component of the regeneration of coastal communities in the Southeast Baltic. Indeed, without a steadily growing income from recreational boating, it is doubtful whether many of the smaller ports and harbours which were once dependent on fishing or military activity could survive.

Boating is not only a significant source of income in its own right but it also attracts non-boating tourists and holidaymakers who enjoy the ambience provided by yachts, pleasure boats and cruisers. Assured of a core audience, many coastal towns arrange events such as regattas, musical entertainment, maritime heritage weekends, etc., throughout the season which in turn attract more visitors by both land and sea.

At present, it would seem that the impact of recreational boating in the Southeast Baltic is wholly positive in terms of stimulating sluggish economies and creating jobs. There is considerable potential for further growth in marine tourism:

- A marina is planned as part of the reconstruction of the port of Pionersk on the Russian Baltic sea coast.
- The naval port of Baltiysk (at the mouth of the Kaliningrad Marine Canal, the waterway from Kaliningrad to the open sea) includes a number of sites that have been earmarked for recreational activities.
- Both Yantarny and Zelenogradsk in Kaliningrad Oblast have been suggested as possible sites for a marina.
- There is a plan to build a large marina in Sventoji next to the Lithuanian border with Latvia, and to develop several recreational ports on the Minija and Nemunas upriver from the Curonian Lagoon.
- Ustka in Pomorskie has had plans approved for a new marina with dry-stack storage facilities.
- If the proposal to cut a canal through the Vistula Spit in Polish waters goes ahead, an increase in boating activity in the western part of the Vistula Lagoon can be expected.
- A similar impact would follow if checkpoints were established to facilitate cross-border sailing in both the Curonian and Vistula Lagoons.

4.2 Blue Economy in the Southeast Baltic

The importance of the Southeast Baltic coastal and marine areas for the landscape and cultural features and associated habitats and species is demonstrated by the fact that 45 % of the Lithuanian coast is protected by statutory designations compared to 26 % of the remainder of Klaipeda County and 15.3 % for Lithuania as a whole. In Poland, the figures are 55 % of the Pomorskie coastal zone, 39 % of the remainder of the voivodeship and 35 % for the whole of Poland. The proportion of the coastal zone designated under Natura 2000 legislation in Poland is second only to Slovenia among all European Union (EU) coastal Member States.

Both Poland and Lithuania saw a significant increase in the area under protection following accession to the EU in 2004 and the implementation of the Birds and Habitats Directives. Two coastal protected areas in the Southeast Baltic – the Vistula and Curonian spits – are transboundary, that is, they are divided by national frontiers and hence require joint management arrangements. There are no marine protected areas in Kaliningrad Oblast whereas in both Klaipeda County and Pomorskie Voivodeship there are several areas of sea protected by Natura 2000 regulations (Fig. 7).

The area of land and sea protected by statutory designations is a proxy for the importance of the coastal zone for wildlife; for natural areas, special landscapes and landforms; and for archaeology and cultural heritage. Importance should be reflected in the type of protection given. Generally speaking, there is a hierarchy of designations ascending from sites significant at the local level, through those of regional importance to those of national significance. The cream of the crop are sites protected because of their value at the European scale as well as those such as World Heritage Sites and World Biosphere Reserves which merit protection because of their global importance.

A network of overlapping local, regional, national and international designations characterises the situation in the Southeast Baltic. Of global significance is the Curonian Spit which was inscribed on the UNESCO World Heritage List in 2000. The spit is shared by Russia and Lithuania. The Russian part lies within Kurshskaya Kosa National Park, created in 1987; the larger Lithuanian part is within Kursiu Nerija National Park, created in 1991. 37 % of Kursiu Nerija National Park is land, 16 % lagoon and 47 % open sea. By contrast, there is no statutory protection of either lagoon or sea within Kaliningrad Oblast (although a non-statutory water protection buffer extending to 10 km. offshore is recognised) (Fig. 7).

A similar situation pertains in the delta of the Nemunas river and the adjacent eastern coast of the Curonian Lagoon, a complex mosaic of wetland and forest habitats, with rivers, canals, marshes, meadows and forests. These unique, pristine wetlands are the largest such area in the Southeast Baltic region and play a key role in maintaining the biodiversity of the region. The northern part of the delta is located in Lithuania and was designated as a Ramsar site in 1993. The southern part is Russian territory and despite its huge significance for migratory birds still does not have Ramsar status although it meets the Ramsar criteria for identifying wetlands of international importance in a number of respects.

Slowinski National Park in Pomerania was designated a UNESCO World Biosphere Reserve in 1977. Its 32.5 km of coastline were subsequently declared a Ramsar site. There are two ‘landscape parks’ on the Polish coast. The Coastal Landscape Park in Puck County covers 188 sq. km and includes within its borders nine nature reserves. Similarly, there are two nature reserves within the Vistula Spit Landscape Park of 44.1 km^2. As with the Curonian Spit, the Vistula Spit is divided by an international boundary. To the north, in Russia, the spit is contained within a ‘State Zoological Reserve’. This nesting of weaker designations within stronger European and international ones is typical of the region.

Around 90 % of the areas protected until 2004 by national and regional legislation in Pomorskie Voivodeship and Klaipeda County are now protected by EU legislation or international conventions such as HELCOM. At the same time, the process by which NATURA 2000 sites are identified, monitored and declared has helped give protected status to areas that previously enjoyed no or little protection. This is particularly true of marine areas where significant designations have been made over the past decade in both Polish and Lithuanian waters.

Extensive designations in both Klaipeda County and Pomorskie Voivodeship, largely in response to European legislation, have pushed the proportion of the Southeast Baltic coastal zone protected for its natural and cultural significance almost as high as that of any other coastal area in Europe. Whereas protection under European law is probably strong enough to resist most pressures, there must be concern that there is less protection for the coastal zone in Kaliningrad Oblast. For example, two State Zoological Nature Reserves, Diunny and Zapovedny, are located in the Nemunas delta. However, they provide insufficient protection to maintain biological diversity and the hydrological regime of the area.

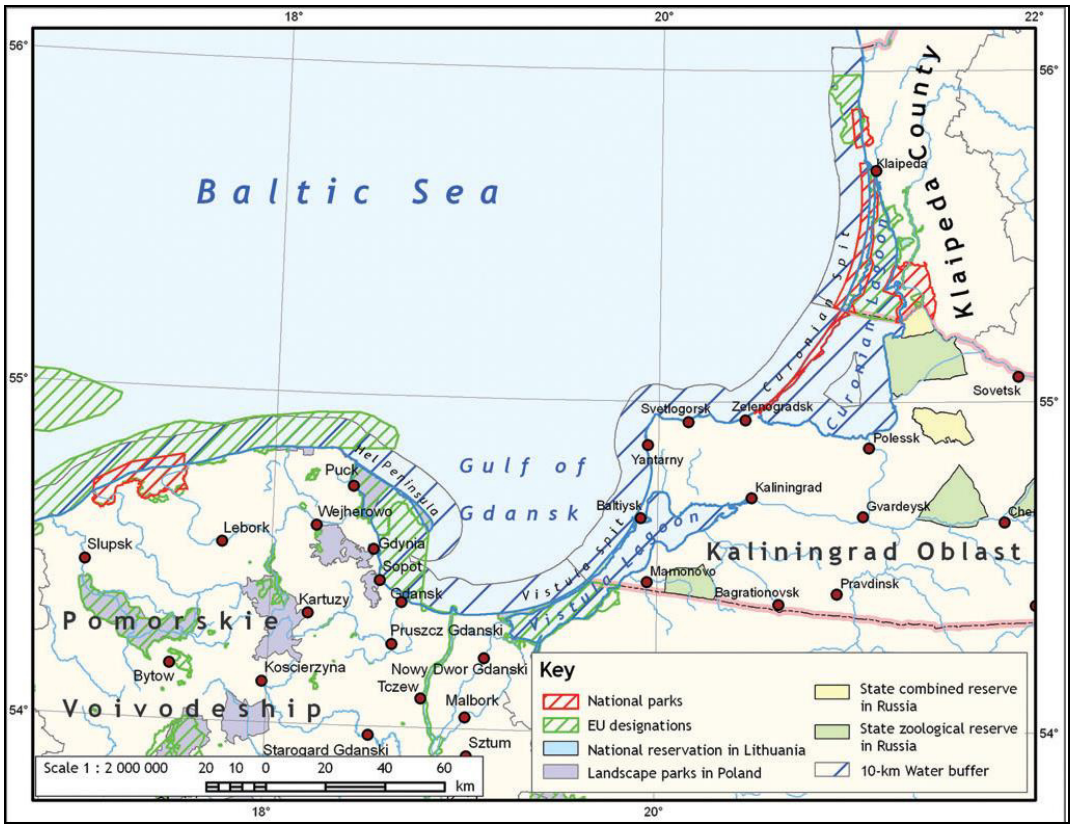

Figure 7: Protected areas in the southeast Baltic coastal zone (Source: Gilbert 2008)

Urgent measures are required to regulate certain kinds of economic activities such as the proposed works for deepening part of the Nemunas River and the coastal part of the Curonian Lagoon. Increasing human disturbance, such as the unregulated development of water-based tourism, threaten this unique natural complex. Frequent spring fires in large areas of reed thickets, peat bogs and woods; regular fires on the embankments of dams; and increased poaching; also give cause for concern. The long term plan for nature conservation in Kaliningrad Oblast includes the creation of 23 protected areas together totalling 2200 km^2.

Designating the wetlands of the Neman river delta a Ramsar site would be an important step towards conserving these valuable habitats for waterfowl and eco-tourism. Their unique landscape and biodiversity value is significant for the whole Baltic region and should provide the basis for further protection and conservation status, such as working with Lithuania to establish a transfrontier protected area of European significance. The network of Baltic Sea Protected Areas (BSPAs) includes 86 officially notified and designated coastal and marine sites, established according to HELCOM Recommendation 15/5.

About one fifth of the BSPAs have a management plan and a further one third have a management plan under preparation. Less than half of the 61 Baltic Sea species identified as threatened and/or declining are included in the protection objectives of the BSPA network. The Contracting States to HELCOM have agreed to improve the conservation status of species and habitats included in the lists of threatened and/or declining species and habitats of the Baltic Sea area by 2015 with a further target to reach and ensure favourable conservation status of all species and habitats by 2021.

Yet, the conservation status of 15% of biotopes throughout the Baltic was ‘heavily endangered’ compared to just 9% that were not under any threat. Nevertheless, this was a better result than ten years previously when HELCOM reported that all protected areas were endangered. A significant number of the 61 species listed as threatened and/or declining by HELCOM are actually outside the boundaries

of any of the 86 Baltic Sea (coastal and marine) Protection Areas. Of ten priority habitats in the Gulf of Gdansk, three were said to be 'heavily endangered' and six 'endangered'.

An assessment of the indicators chosen to measure loss of, or damage to, protected areas revealed that 83% were either endangered or heavily endangered. Just nine per cent reported that conservation status was favourable. At first sight, these conclusions appear rather damning and suggest that although legally protected, designated sites are in a critical situation. To an extent this is true but as HELCOM points out in its assessment, the sites have been chosen because of their vulnerability and that it will take some time to turn them around.

The implications are profound. Contracting States to HELCOM and Member States of the EU have a legal responsibility to maintain and improve Natura 2000 sites and BSPAs and achieve favourable conservation status by 2021. At the very least, that will mean adopting a more sophisticated, extensive and integrated monitoring system than is presently in place together with management plans for each site, and biodiversity action plans for both species and habitats, almost certainly at the Southeast Baltic Sea level. The results of the monitoring should lead to a clearer picture of the actual conservation status and its trends on various levels and will indicate the effectiveness of the Habitats Directive and the BSPA network in approaching and reaching their objectives.

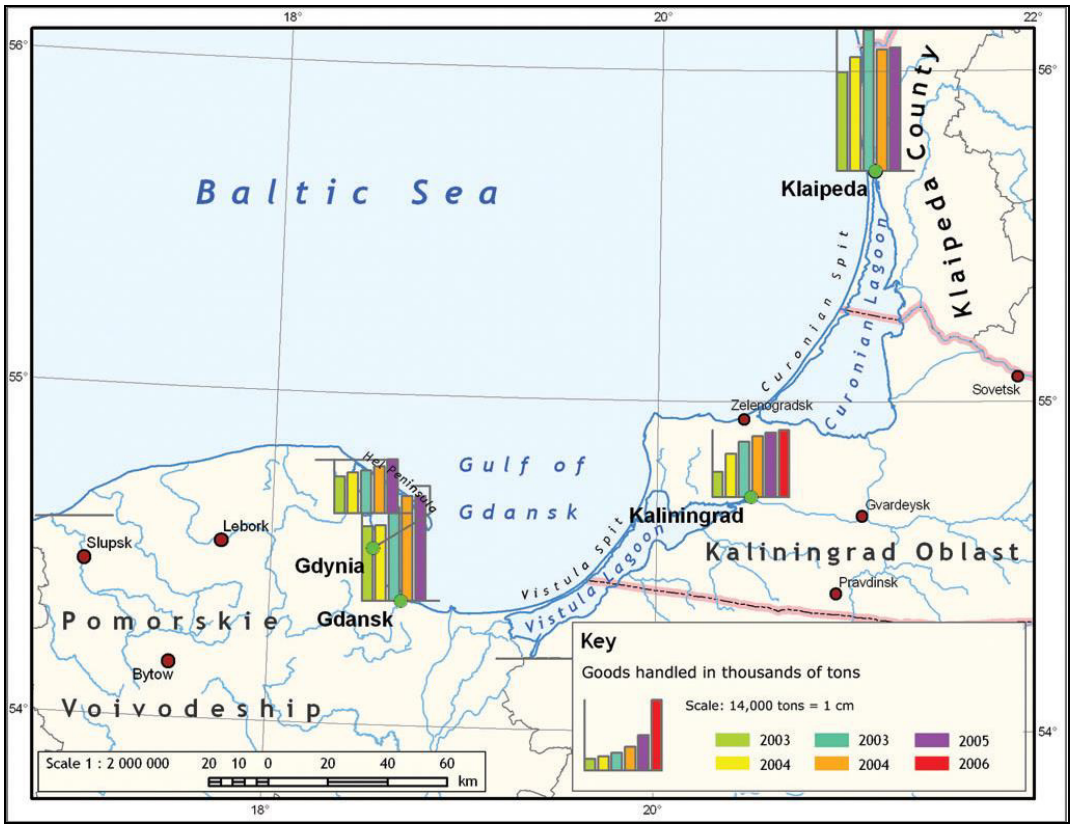

Figure 8: Volume of cargo handled in the Southeast Baltic ports (Source: Gilbert 2008)

All four of the biggest ports in the Southeast Baltic region (Gdansk, Gdynia, Klaipeda and Kaliningrad) show growth in both numbers of passengers and volume of cargo handled. However, significant differences persist in the pace of port development. The biggest passenger port in the Southeast Baltic Region is Gdynia with a throughput of 470 thousand passengers in 2017; the biggest cargo port is Klaipeda with over 35 million tonnes handled in 2017. Passenger traffic has increased overall since the turn of the 21st century although this has been due almost entirely to flows which originate in, or are destined for, ports outside the Southeast Baltic region. Intra-Southeast Baltic traffic has virtually ceased.

The strongest performing port in recent years in terms of cargo handled has been Marine Port Kaliningrad although volumes are small compared with Klaipeda and ports in Pomorskie. Each sub-region has ambitious port expansion plans which need to be tested rigorously against sustainability criteria. We want to build-up a picture of the relative importance of ports for Blue economy in terms of the throughput of both passengers and cargo. For many ports, passenger traffic is their lifeblood and the loss of a ferry service or the building of a cruise ship terminal can change their prospects dramatically, not least because of the knock-on effects in terms of local tourism, demand for port services and pressure for associated infrastructure, especially roads.

The effect of changes in the amount of goods handled on local employment or the demand for port services is more difficult to ascertain because nowadays cargo is loaded and unloaded mechanically. Again, it is often hard to work out whether profits generated by port activities are recycled locally or repatriated elsewhere. What is more certain is that an increasing throughput of goods year-on-year will lead to a demand for additional port infrastructure such as new docks, roads, sea defences, freight storage facilities, and so on, and that these will have varying degrees of benefit and disbenefit to the local and regional transport.

Throughput of passenger traffic has increased substantially in the Southeast Baltic since the turn of the twenty first century. Klaipeda, for example, saw an increase of 55% in incoming and outgoing passengers between 2000 and 2006 from 107,000 to 239,000 although a significant proportion of this increase was due to cruise liners docking at a terminal opened in 2003. Exactly what contribution cruise passengers make to the local economy has yet to be calculated. In Pomorskie Voivodeship, the biggest passenger ports are Gdynia (over 450,000 passengers each year) and Gdansk (nearly 200,000).

Passenger traffic in Kaliningrad Oblast is comparatively small. However, Kaliningrad-Pionerskiy is supposedly planning a cruise liner terminal to be built in the near future. There has been a recent increase of 11 % in the number of passengers using ferries from Kaliningrad-Baltiysk to St. Petersburg and an even bigger increase – 37 % – in the number travelling to and from Lübeck in Germany. There used to be a fairly vibrant intra-regional market but this has almost disappeared over the past decade. Short cruises still ply from Gdansk to Kaliningrad- Baltiysk in search of tax-free alcohol and tobacco but the future of the trade depends on ongoing bilateral negotiations between the Polish and Russian authorities.

With regard to the amount of cargo handled, Gdynia (by 34%), Klaipeda (by 32%) and Gdansk (by 29%) have all expanded rapidly since 2000. The strongest performance, though, was that of Kaliningrad-Baltiysk which has grown by 70% since the turn of the century. However, volumes handled by the Russian port remain small at around 14,000 tonnes in 2006 (compared to Klaipeda which transshipped over 35 million tonnes in 2017 and overtook Gdansk to become the biggest port in the Southeast Baltic region). A recent forecast suggests that port activity in the Eastern Baltic will increase by at least a further third over current figures by 2020 but that expansion may not be uniform across the Southeast Baltic region.

Of crucial importance will be investment in railway connections to the south and east. Klaipeda is well-placed in this regard: the port is linked already to Odessa on the Black Sea via Minsk and Kiev and will be the western terminus of the new Trans-Siberian Mainline to Vladivostok via Vilnius, Minsk, and Moscow. Gdansk is planning similarly: a new freight connection to Brno/Bratislava via Warsaw built within the framework of the EU Trans-European Network should be operational by 2020. Gdynia and Gdansk derive a significant proportion of their income from handling Russian oil in transit to western Europe and hence a proposed pipeline by-passing the ports is a considerable threat.

Not surprisingly, both ports are looking intently at alternative cargos – Gdynia has doubled its container-based general cargo trade to 460,000 20ft equivalent of cargo in just five years. EU policy is to revert by 2010 to the modal split in transport that prevailed in 1998. ‘Motorways of the Sea’ is the principle policy tool to bring this about. The motorways are intended to concentrate freight flows on sea-based logistical routes with the objectives of reducing road congestion and/or improving access to

peripheral and island regions and countries. Four motorways of the sea corridors, one of them for the Baltic Sea, have been designated so far.

Research has identified a number of links with the greatest potential to take advantage of the Baltic Motorway. They include Gothenburg-Klaipeda, Karlshamn-Klaipeda and Karlskrona- Gdynia. In addition, Kaliningrad-Baltiysk has been nominated as one of only two ports (the other being St Petersburg) ideally placed to service the Motorway and provide transshipment facilities. The well-being of the Southeast Baltic ports is essential not only for local economies but for the national economies as well. Klaipeda seaport, for example, provides 23,000 jobs and accounts for 4.5% of Lithuania's GDP. A little less than one third of all goods traded internationally passes through the Klaipeda seaport.

But fulfilling expansion plans can be realised only with massive investments in new infrastructure and inevitably some schemes will be in conflict with other land uses, not least areas designated for landscape and nature conservation. Solutions will have to be bold and innovative such as the massive artificial island at Klaipeda which will act as an 'avant-port' for the city. The new island will be about 1.8 km long and 0.6 km wide to accommodate the expected increase in traffic. Moreover, it will be a deep-water port with 17.5 metres of water, allowing it to lodge larger vessels.

Port expansion and operational activities can co-exist happily with recreation and tourism (ports can become tourist attractions in their own right) and with priority habitats, landscapes and seascapes. The key to success is to prevent piecemeal, small-scale development and to draft a multifunctional strategy based on sound integrated coastal management principles including marine spatial planning in all three countries in the Southeast Baltic region. Consistent tightening of the regulatory screw over the past three decades has reduced both the number of major incidents and the volume of oil spilled accidentally and deliberately at sea even though the number of ships increased during that time.

The total number of detected oil slicks is inversely proportional to the number of hours flown by surveillance aircraft. Since drilling began in 2004, there has been no evidence of oil pollution originating from LUKOILKaliningradmorneft's D-6 offshore production platform in the Kravtsovsoe field. Shipping is not the principal source of maritime oil pollution; rather, river run-off, municipal sewage and atmospheric deposition together account for the greatest inputs. However, there is little systematic monitoring of such pathways. It is also the case that without expensive chemical analysis it is not often possible to distinguish between shipping and non-shipping sources of marine hydrocarbons.

4.3 MSP in Kaliningrad Oblast of Russian Federation

Considering the MSP in the Kaliningrad Region of Russian Federation, so far, there are no formal MSP initiatives underway, but interest is slowly developing. Since the major actor in MSP is the Federal Government, the management of marine waters under jurisdiction of many regional authorities might be only limited. There are a couple of pilot projects in Neva Bay and Gulf of Finland, marine waters around Kaliningrad (Fig. 9), and the Russian parts of the Barents Sea and the Bering Sea.

The major tasks for the next period are the following ones:

- Analysis of the situation in the field of application of the MSP tools in conjugated marine areas;
- Monitoring of the fulfilment of the bilateral international obligations of the Russian Federation in the field of environmental protection and conservation of biodiversity in the Baltic and Barents seas under the jurisdiction of Russia;
- Development of information and analytical materials on ensuring environmental safety of economic use of water areas in the Baltic and Barents Seas under the jurisdiction of Russia within the framework of international agreements and treaties.

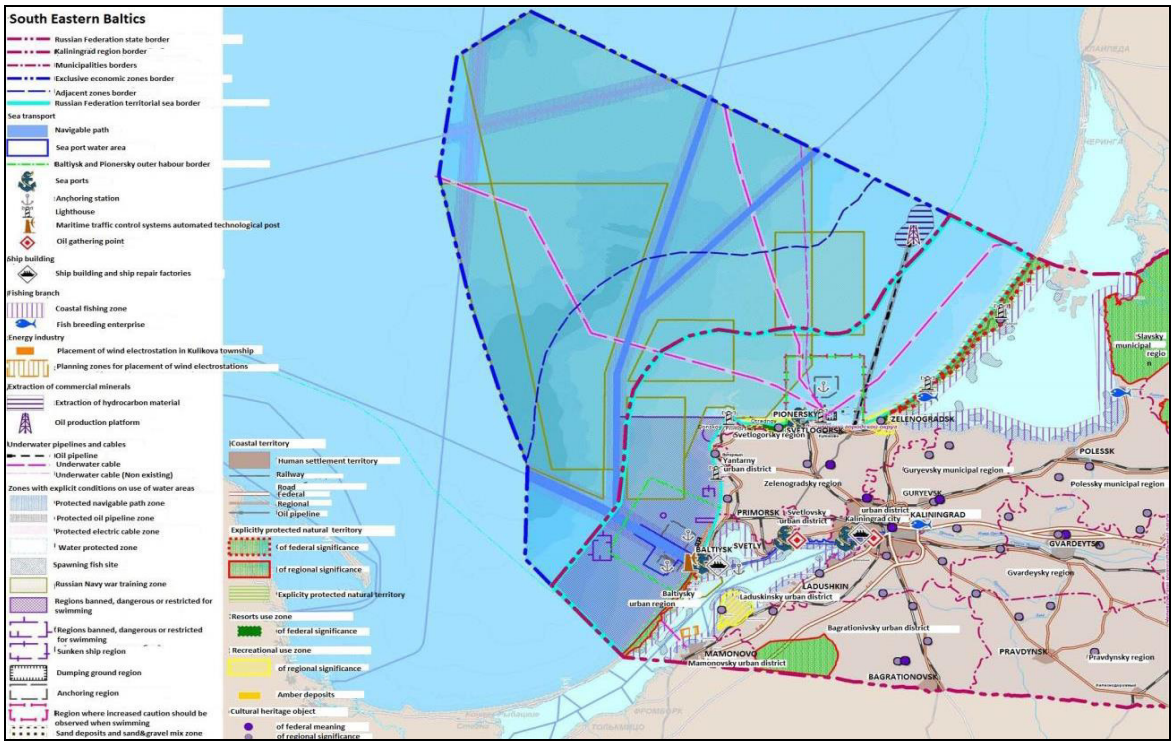

Figure 9: MSP in the EEZ in the Kaliningrad Region of Russia (Southeast Baltic) (Source: VASAB)

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United Nations Sustainable Development Goals to 2030 and Maritime Spatial Planning

1 Introduction

Pursuing the United Nations' (UN) Sustainable Development Goals (SDGs) leads to numerous interrelated socio-ecological and economic consequences. Understanding interrelations between sustainability goals and determining their interactions can help prioritize effective and efficient policy options. However, achieving sustainable development faces many ecological and social challenges, such as single sector resource management, resource scarcity, environmental contamination, and the persistence of forced labour (Singh et al. 2018).

These challenges are interlinked, and to address them will require a concerted international effort beyond independent or specialized programs. In 2015, The United Nations formalized 169 targets to gauge progress towards sustainability under 17 Sustainable Development Goals (SDGs), including, among those goals, goal 14: Life Below Water (the "Oceans goal"), aiming to preserve and use sustainably the oceans, seas and marine resources for future generations.

These goals resulted from international and interdisciplinary collaboration and explicitly allow countries to determine their context-appropriate strategies. The goals are presented independently. While their diversity and scale may seem prohibitive, these goals are in practice often entangled in social-ecological systems, meaning that progress on one can advance or impact a suite of others. Relationships among goals can often be path-dependent, where achieving a certain SDG may contribute to another, but that relationship may not be right in reverse.

2 The UN Sustainable Development Goals

17 UN SDGs include between 3 to 10 targets. The SDGs are a global urge for action to protect the Earth, ensure decent lives for all people, and pursue inclusive economic growth, prosperity, and peace. Adopted by the UN on 25 September 2015, the Agenda for Sustainable Development 2030 is split into 17 interrelated and complementary SDGs, including 169 targets. The targets and goals provide global guidance to all governments, enabling the setting of relevant national targets. Goals focus on the environment (ocean and terrestrial), social justice (ending poverty, hunger, etc.), economy (creating meaningful jobs, sustainable economies), and infrastructure (cities and urban planning).

Understanding the relationships between the 17 SDGs, and their interdependencies are required to show the interconnections between ocean and society and to indicate where SDG targets work in concert and co-benefit. This understanding potentially allows for greater return on management investment or can indicate where SDG targets conflict, which can inform important decisions regarding trade-offs. The final goal (SDG 17, with 19 targets) focuses on creating international partnerships with the capacity to support the achievement of other goals. The relationships between SDG targets are based on hierarchical principles.

The compatibility of the relationship implies the requirement of the first SDG target for the fulfilment of the second SDG target or not (prerequisite versus optional); and whether or not the compatibility of the relationship is confidently understood as independent of social-ecological context and implementation (context-independent versus context-dependent). However, the SDGs extend beyond the public sector. They are an urge for action to all societal actors, including NGOs and private business, giving special importance to the role of non-state actors, including business.

If we do not achieve the objectives related to sanitation and clean water, life on land, life below water, and climate action, the world will fail to achieve the remaining goals. These are the first level goals. Another level of the SDGs addresses societal issues like the improvement of social justice, peace, the

eradication of poverty, and good health. Societal development depends upon a protected biosphere. These goals are the foundation for the goals related to the economy. Therefore, the last layer of goals relates to economic development. They direct attention towards infrastructure, industry, innovation and eradicated inequalities; responsible production and consumption; economic growth and decent work that is decoupled from environmental degradation.

The 17 Sustainable Development Goals present global goals related to the biosphere, society and the economy. These goals are integrated and inseparable. Society and the economy are embedded within the biosphere. Not only do society and the economy depend on the biosphere, but they also shape it at both local and global levels. While entering the 3rd decade of the 21st century, the environment may no longer be treated as an externality. It rather must be treated as essential for human well-being and sustained economic growth.

Social development depends upon a protected biosphere. In addition, the goals on clean energy, zero hunger, no poverty, peace and justice, education, sustainable cities, gender equality, and good health are the foundation for the goals related to the economy. Given the interdependence across all the SDGs, the actions in one area can directly or indirectly contribute to several goals. The economic goals direct attention towards industry, innovation and infrastructure, reduced inequalities, responsible consumption and production. It also draws attention to decent work and inclusive economic growth that is decoupled from environmental degradation.

Sustainable development is based on three pillars of equal importance: social development, economic development and environmental protection. The very first steps aimed to consolidate sustainable development at the global level were made more than 25 years ago. Back then, the principles of sustainable development were laid down in the Rio Declaration. The subsequent international instruments, such as the Rio+20 Conference Conclusions and the Johannesburg Plan of Sustainable Development, have established agreements among countries to work towards a more sustainable world. However, the growing population, dwindling natural resources, increasing pollution, other environmental, economic and social challenges which go beyond national borders set forth the need to respect and implement the goals and objectives of sustainable development.

In September 2015, over 150 world leaders in New York adopted the 2030 Agenda for Sustainable Development (hereinafter 'the Agenda 2030'). It replaces the Millennium Development Goals valid since 2000. The SDGs complement each other and reflect the equal importance of the three sustainable development pillars. The objectives are also pivotal at the national and global levels and comprise for a more sustainable world. Agenda 2030 is more ambitious than Millennium Development Goals. It embraces a wider range of issues and has to be implemented by both developing and developed countries.

Adopting the Agenda 2030, countries have committed themselves to present Voluntary National Review's to the UN on the implementation of the Agenda 2030. Lithuania prepared and presented such a review in the third year of the implementation of the Agenda 2030. With the approval of the UN Economic and Social Council, Lithuania has received an opportunity to present the Voluntary National Review at a High-level Political Forum (HLPF). At that meeting, which took place in July 2018 in New York, the Voluntary National Reviews on the implementation of the 2030 Agenda were presented by 48 states, with 10 European Union (EU) member states among them.

In accordance with the Johannesburg Plan for Sustainable Development and the guidelines of the European Council, the Government of Lithuania approved the National Strategy for Sustainable Development (NSSD) in 2003. In 2009, the NSSD was updated. It aimed to harmonise the Strategy with the EU Sustainable Development Strategy. The sustainable development priorities and principles of Lithuania were established, taking into account Lithuania's national interests and peculiarities.

The NSSD provides a strategic goal for sustainable development which involves balancing economic, environmental and social development interests, ensuring a healthy and clean environment, saving of natural resources, universal social welfare regarding economic and social indicators as well as the

efficiency of natural resource consumption, the EU15 average of 2003, while keeping the environment pollution indicators within limits permissible by the EU and respecting the requirements of the international conventions limiting the impact on the world climate.

3 The UN Sustainable Development Goals and MSP

Ocean targets comprise ecological and socio-economic concerns, including reducing marine pollution (SDG 14.1); restoring marine habitat (SDG 14.2); reducing impacts of ocean acidification (SDG 14.3); eliminate overfishing as well as illegal, unreported and unregulated fishing (SDG 14.4); conserve marine areas (SDG 14.5); eliminate harmful fishing subsidies (SDG 14.6); and increase economic benefits to Small Island Developing States and least developed countries (SIDS, SDG 14.7). The current state of global oceans limits the potential to achieve far-reaching sustainability objectives (Pauly et al. 2002; Sumaila et al., 2016). Realising sustainable oceans has the potential to contribute to other sustainable development goals, though currently this SDG has the least identified progress, and has received the third-lowest philanthropic funding (Singh et al. 2018).

Relationships can also be characterised differently depending on the nature of the contribution (Wasserman & Faust 1994). In some cases, achieving an SDG target may be required to attain another SDG target (Nilsson et al. 2016). For example, achieving sustainability of food production systems (SDG 2.4) requires the elimination of harmful fishing practices and overfishing (Target 14.4) (McClanahan et al. 2015). In other cases, achieving a specific SDG target can contribute to but not be a prerequisite in realising a different target. For example, establishing effective marine protected areas (Target 14.5) may contribute to ecosystem restoration (Targets 14.2 and 15.5), but there are other ways that ecosystem restoration can be achieved.

Most importantly, this framework allows for an understanding of the prevalence of co-benefits of the MSP-related targets versus trade-off relationships between ocean sustainability and other SDGs in particular settings implied by the MSP processes worldwide. This framework was used to characterise the contribution of SDG 14 to other SDG targets globally. It is understood in several different aspects (Singh et al. 2018, pp. 224-225):

- Co-benefit-optional-context-dependent: Eliminating marine pollution (SDG 14.1) can contribute to eliminating malnutrition (SDG 2.2) by increasing the availability of marine resources for food, though ending malnutrition can be achieved without reducing marine pollution and reducing marine pollution may not have any effects on malnutrition;
- Co-benefit-optional-context-independent: Increasing marine resources availability through marine restoration (SDG 14.2) can invariably help end malnutrition (SDG 2.2), but there are other strategies to can end malnutrition without relying on marine restoration;
- Trade-off-optional-context-dependent: Establishing marine protected areas (SDG 14.5) can work against improving rights and access to resources (SDG 1.4) if they are established and enforced without engaging local stakeholders. However, protected area planning may mitigate against these conflicts through proper consultation;
- Neutral: Reducing impacts from ocean acidification (SDG 14.3) has no influence on reducing mortality from road traffic accidents (SDG 3.6).

Increasing economic benefits to Small Island Developing States (SIDS) and least developed countries (SDG 14.7) is the only target associated with all 16 SDG goals considered. Ending overfishing (SDG 14.4), environmental restoration (SDG 14.2), and marine protection (SDG 14.5) were associated with 14, 14, and 13 SDGs respectively. Ending harmful subsidies (SDG 14.6), reducing marine pollution (SDG 14.1), and reducing impacts from ocean acidification (SDG 14.3) were associated with 11, 11, and 8 SDGs respectively. Ending overfishing is essential for the MSP process and can be positively related to the largest number of other SDG targets, including the largest number of obligate relationships.

All MSP-related SDGs are associated with progress on achieving the Oceans goal (SDG 14). Six SDGs are positively related to every Oceans target: ending poverty (SDG 1), ending hunger (SDG 2), creating sustainable cities and communities (SDG 11), climate action (SDG 13), life on land (SDG 15), and peace, justice, and strong institutions (SDG 16). In contrast, only four SDGs relate to three or fewer Oceans targets:

- good health and wellbeing (SDG 3);
- gender equality (SDG 5);
- clean water and sanitation (SDG 6);
- affordable and clean energy (SDG 7).

These findings indicate that achieving six of the seven and five of the seven Oceans targets are necessary in order to achieve the SDG goals of ending poverty and hunger, respectively. Most relationships between Oceans targets and other SDG targets are co-benefits – indicating compatibilities between the Oceans and other SDG targets. Of the 267 non-neutral relationships between ocean SDG targets and other SDGs (35% of all relationships), 260 are co-benefits, and 7 are trade-offs – indicating that there may be an incompatibility between specific Oceans targets and other SDG targets. Ending overfishing (SDG 14.4), creating marine protected areas (SDG 14.5), and ending harmful fishing subsidies (SDG 14.6) can lead to trade-offs with other SDGs.

Both ending overfishing (SDG 14.4) and ending harmful subsidies (SDG 14.5) have trade-off relationships with Decent Work and Economic Growth (SDG 8). The specific target that has trade-off relationships (the number of youth in employment or training) only considers a short term relationship as the achievement date for this target is the same year as the achievement of the Oceans targets and does not represent long term relationships. Marine protection (SDG 14.5) has negative relationships with the largest number of other SDGs, including Ending Poverty (SDG 1), Reducing Inequalities (SDG 10), and Peace, Justice, and Strong Institutions (SDG 16).

These trade-offs are all associated with targets focussed on inequalities (and associated conflict) and resource access concerns. Experts indicated that we might avoid these trade-offs through protected area consultation and implementation. In the long term, the protected areas may increase marine productivity that spills over protected area boundaries and increase resources for people. All trade-off relationships are classified as “optional-context dependent”, indicating that the trade-off relationships may not be guaranteed. The ground for their mitigation is policy implementation. Approximately half of the non-neutral relationships between Oceans targets are prerequisite-context independent or optional-context independent (128 of 267 relationships).

Oceans targets are related to 42 other SDG targets through prerequisite-context independent and optional-context independent linkages. Of these 44 SDG targets, 14 SDG targets relate to Oceans targets solely through prerequisite-context independent and optional-context independent relationships. The remaining 139 of 267 relationships are optional-context dependent between Oceans targets and other SDG targets. Oceans targets are related to 62 other SDG targets through optional-context dependent relationships. Of these 63 SDG targets, 31 SDG targets are solely related to Oceans targets through optional-context dependent relationships.

Some SDG goals are more dependent on achieving Oceans targets than others. There are also multiple synergies between Oceans targets, and the results presented here show that every Oceans target is a prerequisite for achieving at least one other Oceans target (e.g. regulating illegal harvest and overfishing – SDG 14.4 – is a prerequisite for restoring marine ecosystems – SDG 14.2). Ending Poverty (SDG 1) and Ending Hunger (SDG 2) are also highly dependent on ocean sustainability, as indicated by the number of obligate relationships between the targets of these diverse goals and the Ocean target.

Considering also optional relationships (where a target is not a prerequisite for another), each sustainable oceans target contributes to most of the targets in each of SDGs 1 and 2 (ending poverty

and hunger). This large number of context-dependent co-benefits may reflect the counterfactual nature of target 14.7: sustainable marine development is not currently the norm and so not currently tied to other targets, though if benefits are distributed correctly, then many potential co-benefits can be achieved. Ending overfishing (SDG 14.4) on the other hand, has the largest number of connections, and also the largest number of co-benefit-prerequisite-context independent relationships, with other SDGs.

Fishing is an established activity in many coastal settings and is intricately tied to many different peoples' cultures, livelihoods, and local environments. For example, combating illegal fishing and overfishing includes combating illegal labour practices (making addressing this target a prerequisite for ending modern slavery – SDGs 8.7 and 16.2), will allow children and other people who otherwise would have spent their time working on boats access to education (SDGs 4.1 and 4.3), will allow for more reliable and bountiful seafood production needed for people to access food and end malnutrition (SDGs 2.1 and 2.2), and will lead to fishing systems guaranteed for future generations, preserving biological and cultural heritage (SDG 11.4).

Also, there are trade-offs between achieving Oceans targets and other SDG targets. All trade-offs are classified as optional-context dependent, indicating that trade-offs may be avoided in some contexts. For example, ending overfishing (SDG 14.4) and harmful fishing subsidies (SDG 14.6) can contribute negatively to targets related to youth employment (SDG 8.6) through a reduction in fleet capacity, although this may only happen when people have no alternative employment options. This trade-off may only result in a short-term effect, however, and in the long term, as fish productivity and abundance increase more fishing-related jobs may be available.

Short term trade-offs are recorded here because SDG 8.6 has a goal date of 2020, which coincides with the achievement dates of ending overfishing and harmful subsidies. Similarly, designating marine spaces as marine protected areas (MPA) may preclude coastal people's access to local marine resources, which might limit progress on those SDG targets associated with ending hunger (SDG 1) and diminishing disparities that affect poorer people (SDG 10). Protecting given marine spaces may also merely displace fishing effort to other areas, further reducing the resources available to local people.

If resource disparities are enhanced through limiting access to marine resources, then the risk of resource-based conflict might also increase, negatively affecting SDG targets aimed at reducing conflict and violence (SDG 16). Proper consultation and implementation with local people might avoid many of these trade-offs. Most trade-offs characterized here (5 of the 7) are associated with marine protection (SDG 14.5), which – despite increasing evidence for positive ecological outcomes – has been linked with the displacement of coastal communities and conflicting visions of marine management objectives.

These trade-offs suggest that the current global emphasis on marine protected areas may have unintended consequences for social equity if these are not identified and addressed appropriately and effectively during the implementation phase of protected areas. SDGs can be largely complementary and even dependent upon one another. One hypothesis is that the Oceans goal (SDG 14) is one of a few SDG goals with wide-ranging co-benefits (and fewer trade-offs), which, if true, could lead to the argument that attention to ocean sustainability should be prioritized.

A second hypothesis is that most (if not all) SDGs have wide-ranging co-benefits with other SDGs, in which case no SDG should be prioritized. Another hypothesis is that economies and societies are embedded parts of the biophysical environment, and SDG goals related to the biophysical environment may be more important in supporting other SDGs. Enhancing sustainability in the biophysical environment can contribute to asset-based development, providing local people with an enhanced capacity for development according to their specific ecological and cultural contexts.

Such an asset-based strategy is encouraged over "deficit-based" strategies of development – a development that is focussed on needs and community insufficiency, and where resources are

externally provided. Asset-based strategies seek to capitalize on and enhance existing capacity to respond to priorities and do not depend upon input from exterior sources (such as an outside charity). A final hypothesis is that the SDGs that tightly couple environment, society, and economy may be the most important for meeting/ achieving diverse sustainability goals. In this study, the marine targets that contributed positively across other targets and goals focus on fisheries (target 14.4) and benefit-sharing to develop sustainable marine uses (target 14.7), both of which inherently tie environment, culture, and economy together.

These Oceans targets (14.4 and 14.7) affect more targets than solely biophysically focussed targets that have more loosely coupled connections to society and economy, such as marine pollution (target 14.1), marine restoration (target 14.2), and responding to ocean acidification (target 14.3). Often social and economic considerations may be as important as biophysical resource sustainability. Determining whether the Oceans goal (SDG 14) is unusual in its widespread contribution to other SDGs, or similar to other SDGs, will require the application of the framework proposed here to these other SDGs.

In other words, the Oceans goal may similarly be dependent on other SDG goals being achieved (e.g., sustainable consumption patterns – SDG 12 – are necessary to achieve sustainable fisheries). Two of the Oceans targets (ending overfishing – SDG 14.4 – and increasing economic benefits to SIDS – SDG 14.7) are associated with a disproportionate number of targets and perhaps should be given global priority among all Oceans targets. This assessment highlights that increasing economic benefits to SIDS (SDG 14.7) is associated with many co-benefits that are context-dependent, indicating that effective policy implementation will be important to fulfil the co-benefit potential of this Oceans target.

Careful consideration of where economic and development benefits are distributed among and within SIDS can help realize co-benefits as diverse as access to resources (SDG 1.4), reducing maternal mortality through poverty and hunger (SDG 3.1), increasing leadership roles for women (SDG 5.5), enhancing scientific research (SDG 9.5), and reducing violence stemming from poverty (SDG 16.1). Given the lack of progress towards achieving SDG14, the framework provided here provides an initial overview of the relevance of Oceans targets to the advancement of other SDGs. It provides not only a strategic approach to finding co-benefits for given concrete actions in achieving the SDG goals, but also a concrete and direct representation of existing connectivity in our efforts to pursue sustainable development.

Notably, the framework demonstrates the potential benefits of prioritizing action on ending overfishing and providing economic benefits for SIDS (given proper policy implementation). The ocean economy contributed around 1.5 trillion USD, or 2.5%, to the global gross value added (GVA) in 2010, providing around 31 million full-time jobs. Most workers are employed in industrial fisheries and tourism. The OECD projects GVA from the ocean economy will grow to more than 3 trillion USD in 2030. The output of the maritime industry in 2030 is estimated at 510 billion USD GVA and 6.5 million full-time jobs.

As such, the ocean space will be a significant contributor to the SDGs related to social and economic development. However, ocean space is vulnerable, and marine resources are limited. Many of these resources are non-renewable and reaching critical limits. Careful management and governance of marine ecosystems and oceans are needed to use and protect resources sustainably. The economic output of the maritime industry is estimated to 300 billion USD gross value added (GVA) and 5 million full-time jobs. The total output for all ocean industries is around 1.5 trillion USD GVA and 31 million full-time jobs.

4 Specific SD goals, targets and MSP-related actions

SDG 2: Zero hunger

The goal aims to end poverty in all its forms everywhere.

(Targets 2.1, 2.c)

- Facilitate harvesting and production of sustainable food from the ocean space by supporting installation and operation of production assets, especially, sustainable aquaculture.
- Provide affordable and sustainable transportation of food.
- Provide affordable and sustainable transportation of goods and people.
- Provide affordable access to markets.
- Provide access to basic goods for vulnerable groups to build resilience and in cases of emergencies.
- Facilitate job creation and growth as a result of sustainable maritime economy (Blue Growth).
- Contribute to affordable energy and access to food through facilitating energy and food production in the ocean space.

SDG 6: Clean water and sanitation

(Target 6.3)

- Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
- Substantially increase water-use efficiency and ensure sustainable withdrawals and supply of freshwater.
- Expand international cooperation and capacity-building support to developing countries in water and sanitation-related activities, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

(Targets 6.4, 6.a)

- Strengthen resilience and adaptive capacity to climate-related hazards, and integrate climate change measures into policy, strategy and planning.

SDG 7: Affordable and clean energy

The goal aims to ensure access to affordable, reliable, sustainable and modern energy for all.

(Targets 7.1, 7.2, 7.3)

- Ensure universal access to affordable, reliable and modern energy services, increase the share of renewable energy and double the rate of improvement in energy efficiency.
- Provide services for distributing renewable energy – dependent on the type of energy and location of production.
- Provide services and technology related to harvesting offshore energy, for example solar, tidal, wind, wave and biomass energy.

SDG 8: Decent work and economic growth

The goal aims to achieve higher levels of economic productivity, improve global resource efficiency and decouple economic growth from environmental degradation.

(Targets 8.5, 8.7, 8.8)

- Promote sustainable tourism.

(Target 8.9)

- Develop sustainable and resilient infrastructure to support economic development and human well-being, with a focus on affordable and equitable access for all.

SDG 9: Industry, innovation and infrastructure.

The goal aims to build resilient infrastructure, to promote inclusive and sustainable industrialization and to foster innovation.

(Target 9.1)

- Upgrade infrastructure and retrofit industries to make them sustainable

(Target 9.4)

- Enhance scientific research and technological capabilities, and encourage innovation and substantially increase the number of R&D workers and private R&D spending.

(Target 9.5)

- Retrofit and upgrade its own vessels with new, environmentally friendly technologies.
- Improve shipping services in geographical areas where there is a further need for affordable and equitable access to shipping services.
- Provide affordable and sustainable shipping services facilitating economic growth and job creation across industries.
- Continue to improve labour rights and safety practices in its own operations, by implementing ILO, SOLAS and other relevant conventions, and by setting requirements for suppliers within ship design, construction and scrapping.
- Enhance adaptive capacity, to enable stakeholders in the maritime industry value chain to adapt and respond to climate change and related risks.
- Increase spending on R&D in the ocean space and in related industries and join public and/or private partnerships to develop infrastructure to support sustainable resource exploitation.
- Continue to use maritime regulatory institutions to develop and implement common safety regulations.
- Provide access to training and development in all segments.
- Provide sustainable cruises to support sustainable tourism.

SDG 10: Reduced inequalities.

The goal aims to reduce inequality within and among countries.

(Target 10.7)

- By 2030, achieve the sustainable management and efficient use of natural resources.

SDG 12: Responsible consumption and production.

The goal aims to ensure sustainable consumption and production patterns.

(Target 12.2)

- Halve global food waste and reduce food losses along production and supply chains.

(Target 12.3)

- Achieve environmentally sound management of chemicals and all their wastes throughout their lifecycles, and significantly reduce their release to air, water and soil.

(Target 12.4)

- Substantially reduce waste generation.

(Target 12.5)

- Encourage companies to adopt sustainable practices and integrate sustainability information into their reporting cycles.

(Target 12.6)

- Facilitate harvesting and production of sustainable food from the ocean space.
- Continue to reduce waste generation, including food waste, from its own operations.
- Prevent food losses in the value chain by providing efficient and reliable transportation of food.
- Continue to improve management of the use of chemicals in its own operations.
- Ensure diversity and living wages within its maritime economy and for suppliers.
- Ensure that all sea transport is orderly and safe.
- Work with governments to enhance search and rescue activities in relevant areas.
- Continue to reduce discharges of chemicals from maritime economy operations.
- Implement reporting on sustainability performance based on recognised standards such as the Global Reporting Initiative (GRI) or the International Integrated Reporting Framework.
- Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries and encourage and promote effective public, public–private and civil society partnerships.

SDG 13: Climate action

The goal calls for urgent action to combat climate change and its impacts. It acknowledges the UNFCCC as the main international intergovernmental forum for negotiating the global response to climate change.

(Targets 13.1, 13.2)

- Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

(Target 13.3)

- Promote understanding and create awareness in the maritime industry of possible climate risks (physical, policy and legal, technology, market and reputation- related) and their financial impacts in the Marine Economy value chain.
- Enhance adaptive capacity to enable actors in the Marine Economy value chain to adapt and respond to climate change and related risks.
- Set requirements for suppliers within ship design and construction for low- or zero-carbon ships and for improving the carbon footprint of shipbuilding.

- Continue to reduce harmful discharges to sea from its own operations, particularly in freshwater areas.
- Continue to reduce the use of hazardous chemicals in its own operations, particularly in freshwater.
- Improve water efficiency directly in the maritime industries.
- Contribute to GHG emission reductions in other transport sectors by transferring transport work from road to sea.
- Share knowledge and technology within and across maritime industries for desalination of saltwater for drinking water purposes.
- Share know-how for sanitation solutions and enable technology transfer from maritime industries for use in urban and rural settlements.
- Facilitate offshore production and distribution of clean water.
- Develop cost-efficient solutions to transport water from areas with abundant supply to areas with water scarcity.

SDG 14: Life below water

The goal aims to conserve and sustainably use the oceans, seas and marine resources for sustainable development.

(Targets 14.1, 14.2, 14.3)

- Prevent and significantly reduce marine pollution, sustainably manage and protect marine and coastal ecosystems and minimize and address the impacts of ocean acidification.
- Introduce measures to prevent the introduction of and significantly reduce the impact of invasive alien species.

SDG 17: Partnerships for the goals. The goal aims to revitalize the global partnership for sustainable development.

(Targets 17.7, 17.14)

- Participate in partnerships with industry, NGOs and public bodies to promote sustainable practices, technology transfer and experience sharing.
- Promote sustainable maritime transport solutions.
- Develop shipping-specific sustainability policies and mechanisms through the IMO and industry-specific collaborative initiatives.
- Contribute in making international governance of the ocean space more effective, and in improving coordination with other international bodies.

5 The UN Sustainable Development Goals and MSP in Lithuania

Within each country, different targets within SDG 14 (as well as different SDGs) are under the purview of different administrative bodies, often with independent (and potentially conflicting) agendas. These governance considerations can modify how this framework can be applied. The applying of this rapid assessment can help determine how governance has to be modified to achieve goals. Alternatively, policy plans can consider the governance limitations in setting up which relationships can be acted upon, and prioritize policy given these limitations. Lithuania finds it essential to implement the 2030 Agenda at both national and international levels.

Lithuania has established a National Commission for Sustainable Development (NCSD). It includes the ministers and representatives of NGOs, business associations and research institutions. The main functions of the NCSD are to make biennial reports on the implementation of the National Strategy for

Sustainable Development (NSSD) and make proposals to the Government concerning the updating of the NSSD and sustainable development priorities with the account of the environmental, social, economic and cultural indicators of the state. The Ministry of Environment has established a working group of experts which helps the Ministry of Environment to prepare NSSD implementation reports for presentation to the NCSD.

Lithuania has carried out an analysis of the compatibility of the Agenda 2030 with the national planning documents, including the NSSD. Considering the integration of economic development, the solution to social problems and the protection of the environment, Lithuania has created a system of strategic planning based on the principles of sustainable development. While drawing up the strategic documents, the governmental institutions follow the National Strategy for Sustainable Development and the National Progress Strategy 'Lithuania 2030'. It ensures the policy coherence and integrated solution of problems.

Lithuania has identified the following priority areas that are relevant to the MSP processes: development of innovative economy and smart energy; quality education; development cooperation. Innovative solutions and smart energy are the basis of Lithuania's modern and sustainable economy. By encouraging undertakings to use raw materials with greater efficiency, optimize production processes and reduce waste generation and air pollution, Lithuania has focused on the promotion of eco-innovation and investment in new technologies. The implementation of the National Energy Independence Strategy strengthens the country's energy security, competitiveness and promotes energy saving. Lithuania has built an LNG terminal and launched Lithuanian-Swedish and Lithuanian-Polish intersystem power links across the Baltic Sea.

Lithuania finds the proper implementation of the Agenda 2030 very important. Therefore, a great deal of attention is devoted to its legal framework and institutional implementation mechanism. This process involves all national authorities coordinated by the Ministry of Environment. The new Master Plan of the territory of Lithuania, including its EEZ, integrates the SDGs. The plan is the primary strategic document on the development and spatial expression of the territory of Lithuania and includes all relevant MSP-related spatial planning measures. This plan is a crucial instrument for ensuring the sustainable use of the national maritime territory and protection of its resources.

6 Sustainable Development Goal 14 and MSP in Lithuania

To achieve a systematic and integrated approach to water protection problems and improved efficiency of available resources, in 2017 Lithuania approved the Water Field Development Programme 2017–2023. The Programme lays down the objectives and targets for the protection of the Baltic Sea environment, the management of the Nemunas, Venta, Lielupė and Daugava River Basin Districts, the reduction of water pollution from agricultural sources and the spheres of drinking water supply and wastewater management.

The Programme contributes to the implementation of the national, EU and international laws that establish an obligation to improve the integrated management of water bodies (marine and inland waters) through the use of the sustainable development principles, and to conduct water management according to not to administrative but natural river basin boundaries and implement ecosystem-based management methods of human activities. With a view to ensuring the good environmental status of the groundwater and surface water bodies and the Baltic Sea, reducing flood risk and providing conditions for the whole population of the country to have access to drinking water that meets the safety and quality standards, the Programme sets forth five water sector development objectives:

- improve the status of surface water and groundwater bodies,
- achieve and maintain the good environmental status of the Baltic Sea,
- reduce flood risk and their effects throughout the territory of the country,

- provide the population with quality public services of drinking water supply and wastewater management and
- reduce environmental pollution with wastewater, and implement the requirements of water protection and use more effectively.

When carrying out economic activities in the sea, account should be taken of its features, natural processes, protected habitats and sensitive species, and human-induced biodiversity loss should be prevented. The planned actions represent an obligation to improve the integrated management of the marine environment by using an ecosystem-based method for the management of human activities and providing conditions for the sustainable use of marine assets and provided services. In order to solve the problem of eutrophication, the Baltic Marine Environment Protection Commission (HELCOM) has set nitrogen and phosphorus reduction targets for each Baltic Sea country.

Lithuania has assumed a commitment from 2013 to reduce the input of nitrogen and phosphorus to the Baltic Sea by 19% and 56% respectively, compared to 1997–2003 levels. To achieve good environmental status, Lithuania will ensure that populations of commercially exploited fish are within safe biological limits and preserve the structure of the Baltic Sea food web. Measures designed to maintain balanced populations of species must be applied not only in the Lithuanian sea area but also in sea territories occupied by a respective stock group.

It is important for Lithuania to reduce the input of dangerous chemical substances to the marine environment (according to HELCOM information of 2004–2012, 7% of ship accidents recorded in the Baltic Sea ended in some kind of marine pollution), preserve favourable conditions for wintering seabirds in their wintering sites, reduce their mortality rate due to oiling with petroleum products and by-catch in commercial fishing gear, and minimise the risk of the presence of new non-indigenous species in the Baltic Sea (most of the non-indigenous species have arrived in the Lithuanian region of the Baltic Sea with sea currents or vessels, e.g. with ships' ballast water).

In improving the Baltic Sea environmental status, it is sought to ensure that economic activities in the sea have no great adverse impact on seabed habitats and that their loss and deterioration are avoided. In the Lithuanian water area, this is especially relevant for the use of bottom trawls, the dumping sites for dredged materials from the Klaipėda State Seaport, the sites of excavating sand to restore the beaches in Palanga, i.e. everywhere where physical changes of the seabed can directly affect seabed habitats.

The aspect of cooperation is especially important for the environmental protection of the Baltic Sea as an especially unique water body that faces environmental problems due to its isolation and slow water exchange. Lithuania is a Baltic Sea country and an EU member state, and an integrated and sustainable approach to environmental protection, social aspects, and rapid economic development is important. While implementing EU and other international commitments, Lithuania gives priority to cooperation among institutions at the national and regional levels, e.g. using the structures of regional institutional cooperation and the international level.

7 Summing-up

This chapter highlights the importance of the ocean for achieving the Sustainable Development Goals, and suggest that achieving Oceans targets has important co-benefits through supporting diverse aspects of sustainable development and rarely presents negative trade-offs. While these finding are encouraging regarding the potential to simultaneously achieve SDG goals, they are also troubling given the lack of progress towards achieving SDG 14 based on early indicators, and the proportionately smaller funding from major foundations (< 1% of total foundation funds) dedicated to achieve SDG 14.

Of all the 260 positive and 7 negative relationships characterized, 132 positive relationships and 7 negative relationships are considered "optional-context dependent" indicating that these relationships

are contingent on the social-ecological context. A corollary of the contingent nature of some of the relationships is that 38% of the positive relationships are obligate, meaning that these sustainable development targets require ocean sustainability to be achieved.

Fig. 1. Rainbow over the sea as a token of Sustainable Development Goals (© EUCC Baltic Office)

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Interactive strategic planning methodology for MSP

1 Introduction

The MSP process can result in plans and other management documents that decide on the spatial and temporal distribution of relevant existing and future activities and uses in the marine waters. However, the outcome of MSP can also take the form of different non-binding visions, strategies, planning concepts, guidelines and governance principles related to the use of sea space. Generally, MSP is seen as an integrative process to cope with the increasing demand for maritime space from traditional and emerging sectors while preserving the proper functioning of the marine ecosystems.

The critical feature of MSP is its functional character, i.e. integration of various sectors, societal needs, values and intentions. MSP represents a move from a single sector planning to a more integrated approach to the maritime planning. Without an integrated and comprehensive approach, there is a danger that sectoral interests might prevail in the most fragile marine areas which could be detrimental to a broader maritime territory of the South Baltic Sea. The suggested interactive strategic planning methodology implies that the comprehensive MSP strategy should consist of two parts:

- A General Part provides an overview of sustainability conditions summarised as a comprehensive SWOT analysis.
- An Interactive Part provides stepwise recommendations on how a concrete MSP strategy should result from an interactive workshop of stakeholders according to the proposed innovative planning methodology.

2 Strategic planning principles and methodology in MSP

2.1 Purpose of developing maritime strategies

Maritime strategies frequently serve as initial approaches to an actual maritime planning process. They may deliver a roadmap for how to arrange the MSP process within a marine area to empower the vision and goals for realising the national and regional potential of the Blue growth. In contrast to the topic-related MSP procedures, they are therefore rather process-oriented. Maritime strategies help to include the marine areas into the statutory spatial planning process, which has often been missing from national strategic planning documents.

Developing a regional MSP strategy also requires including maritime planning into the existing national and international regulatory framework, which oversees many essential aspects of marine management. It includes EU Directives such as the Marine Strategy Framework Directive (MSFD, 2008/58/EC) and the Water Framework Directive (WFD, 2014/89/EU); the EU's Common Fisheries Policy is ruling commercial fishing obligations and rights; as well as the UN Convention on the Law of the Sea (UNCLOS).

The maritime strategy development addresses two different yet highly interlinked levels:

1. Developing a framework national or regional maritime strategy where MSP is one among various processes.
2. The process of how stakeholders together develop the MSP blueprint plan within the provided governance setting.

On both levels, the strategy may offer a sound basis for supporting comprehensive planning.

2.2 A strategy for MSP and statutory maritime spatial planning

The development of a comprehensive strategy for MSP is an essential preliminary stage for the development of a statutory maritime spatial plan. It can validate the MSP vision if one exists. Nevertheless, developing a strategy should be considered only an initial step in the planning process. The ultimate goal of the planning process is statutory allocation of the maritime space, whereas a comprehensive strategy merely facilitates placing MSP within the regulatory set-up. An MSP strategy can also sketch and help to come to an agreement on key goals, objectives, expectations and ambitions towards MSP (MSP Strategies 2019).

The development of a comprehensive strategy for MSP is not an obligatory part of the MSP planning process. The EU MSP Directive does not require the development of the MSP strategy by setting a framework for maritime spatial planning. Therefore, the decision on developing a comprehensive strategy for MSP should be taken on a case-by-case basis, weighing the benefits and costs. MSP planning process should generally follow some essential steps to ensure proper consideration of vital issues. It is necessary to remember that a "one size fits all" approach which is suitable for all MSP processes does not exist, as it is contingent on present governance frameworks and actors involved.

The successful development of an MSP planning process will depend on who, how and with what resources each step and action will take place. It is depending not only on the available resources but also the particular situation in the geographical context in question regarding present governance structures, available information/knowledge and expertise, supporting institutions, as well as the issues and challenges at stake. Analysing the present governance framework and actors involved may be necessary to support these aspects, and such an analysis should be the first step for defining the whole planning process (MSP Strategies 2019).

Finally, the planning process itself should be flexible and adaptive, since most efforts take a "learning by doing" approach, which necessitates that the stakeholders regularly review, evaluate and adapt the maritime strategies and statutory spatial plans. It therefore implies that the MSP planning process is a continuous and cyclical one where the adoption of a plan simultaneously implies initial preparation for its future revision. Throughout all these phases, the statutory maritime spatial planning process needs to be integrated, inclusive, transparent and dynamic. Hence the need for a comprehensive strategy for MSP as an essential preliminary planning stage.

2.3 Cross-sectoral integration of maritime spatial planning

Because MSP is, by definition multi-sectoral, a potentially large number of stakeholders, managers, and policy-makers are involved. Each institution normally operates on its own (i.e. within its specific sector). However, effective MSP means getting all the actors to interact, communicate and work together in an integrated way. In this, integration respect refers to transgressing boundaries at the physical, institutional, professional, as well as administrative level. To deliver the appropriate measures in an ecosystem-based (integrated) MSP setting, the balance of concerns and interests mainly takes place across sectors (horizontal integration), but also between different governance levels or between stakeholders and government (vertical integration) (Cross-sector integration 2019).

Integration is essential to MSP and particularly relevant to tackle spatial conflicts pro-actively and for facilitating spatial synergies. The multi-use concept is closely related to cross-sectoral integration as the planned joint use of resources in close geographical proximity. It also signifies a radical change from the notion of exclusive resource rights to the inclusive sharing of resources by several uses. It has cross-sectoral integration as one of its essential elements (Cross-sector integration 2019). Three thematic issues to consider for an integrated and comprehensive MSP process include:

- Learning about the maritime ecosystem functioning and complex relationships among the various components within the marine space, coastal community and stakeholder desires and broader regional and national interests;

- Delivering comprehensive, cross-sectoral management of a broader maritime space, integrating coastal and maritime spatial planning;
- Caring that the development of maritime and coastal infrastructure is according to sustainable development principles and environmental regulations.

The most important aspects to ensure sustainable MSP are:

- The professional and dedicated planning process;
- Attention to the limits of acceptable change;
- Setting realistic targets;
- A proper reaction in response to and in anticipation of the Blue economy trend shifts;
- Timely accomplishments;
- The durable and efficient tackling of environmental problems like 'green' transport solutions are also the essential criteria of maritime spatial planning and management sustainability.

However, MSP occurs in the real world, characterised by different individuals and groups, differing value systems, erratic and often conflicting interests.

2.4 Stakeholder involvement

As highlighted in the EU MSP Directive, the management of maritime territories is complex and involves different levels of authorities, sectors, NGOs and other stakeholders. To promote sustainable development in an effective manner, authorities, stakeholders, and the public must commit themselves from the very beginning to the development of comprehensive MSP strategies and preparation of maritime spatial plans. Member States and coastal regional authorities must ensure possibilities for public participation by engaging all interested parties and by consulting the relevant stakeholders and authorities as well as the public concerned at an early stage in the development of comprehensive MSP strategies and preparation of maritime spatial plans (Stakeholder involvement 2019).

'Public participation' and 'stakeholder involvement' are interchangeable terms, even though 'stakeholder involvement' is more pertinent to processes which take into account concerns and issues raised at stakeholder and not at general public levels. Therefore, stakeholder involvement is highly related to participatory planning practices of comprehensive MSP strategies, missions and visions as well as cross-sectoral integration. On the other hand, public participation is more relevant and is more specifically pertinent to planning processes involving the general public. However, the degree of such public engagement may vary substantially, from standard consultation processes or provision of information with an opportunity to comment on plans, to direct involvement in decision-making and action (partnerships).

The term 'partnership' in the MSP process usually connotes a formal process of regular, face-to-face meetings between stakeholders on aims to address shared issues. The MSP partnerships that involve several stakeholder groups can be more equitable and more democratic than if a few state agencies drove MSP planning process. However, while partnerships can help to broaden participation, their asymmetric power relations have to be taken into account seriously. Unless the partnerships take into account the relative bargaining power of the various stakeholders, there is a danger that they provide opportunities for the more powerful. Another obstacle is that these partnerships may deliberately help to achieve pre-conceived planning goals (Urbis & Povilanskas 2019).

Powerful groups have many advantages in collaboration which can mean that their perspectives and priorities will prevail. Influential groups give priority to instrumental and systematic discourses, scientific knowledge, and 'rational' management approaches. Deprived groups give priority to their daily interests and emotions and therefore are at a disadvantage in partnership discussions and often do not attend meetings or otherwise contribute to the Blue growth. It must be evident that there will be no agreement in values and views achieved without additional efforts. These efforts are necessary if the

developed plans have the aim to represent the opinions of all stakeholders and parties potentially interested in the planning process (Urbis & Povilanskas 2019).

Stakeholder involvement may take different forms contingent on whether it concerns more general and strategic MSP issues and strategies or whether it is related to the development of concrete maritime spatial plans. However, stakeholder involvement is not a 'one-off' exercise in an MSP process but serves specific purposes depending on the stage of the MSP process - ranging from 'issue identification', evidence gathering, proposal of measures, consensus building to monitoring and evaluation. It is a horizontal issue, which relates to all other topics (Stakeholder involvement 2019). It is vital that mutual understanding exists along vertical and horizontal collaboration axes regarding what is useful, what is not, and what opportunities exist for sustainable Blue growth and development (Urbis & Povilanskas 2019).

2.5 SWOT analysis

Three groups of development drivers are pertinent for MSP:

- Development Factors (Active Factors - humans and their collectives, non-human living organisms, mechanisms and technologies, real and imaginary objectives and intentions);
- Intrinsic Properties (Strengths and Weaknesses);
- External Circumstances (Opportunities and Threats that determine development scenarios).

SWOT analysis specifies the objectives of a business venture, a development project or a marine area, like in our case, and identifies the intrinsic properties and external circumstances that are favourable or unfavourable to achieving those objectives (Fig./Abb. 1):

- **Strengths:** A marine area can draw its strength from many sources: (1) financial stability, (2) a motivated, capable and loyal workforce, (3) appropriate infrastructure, (4) image of the region;
- **Weaknesses** are the intrinsic properties of the marine area that hinder sustainable development of the Blue economy and prevent the realisation of long-term management plans. The most common weaknesses of coastal and marine areas are related to the lack of motivation and loyalty of staff, unfortunate geographical position and poor value for money;
- **Opportunities** are those external circumstances which enable utilising advantages of the favourable Blue economy development situation in the region (favourable development plans, improvement of the region's image, increase in demand for coastal and marine ecosystem services);
- **Threats** are the phenomena that can ominously impair sustainable development of the Blue economy or the integrity of the marine and coastal environment.

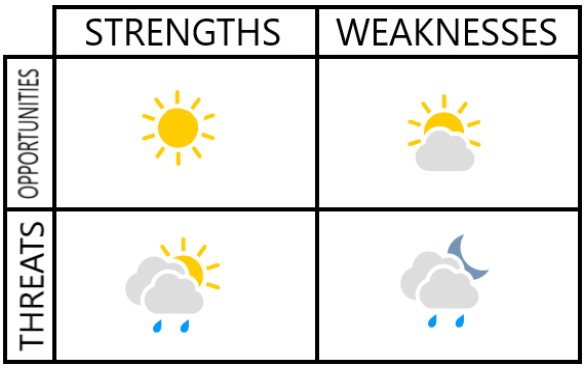

Figure 1: SWOT matrix (drawn by R. Povilanskas)

A SWOT analysis adds a note of realism into planning.

Comprehensive SWOT analysis of the sustainable development of the Blue economy should start from the following questions:

- What are the major concerns of stakeholders?
- What are the main inner obstacles within the marine area hampering its integrity and sustainable development of the Blue economy?
- What are the essential aspirations of stakeholders and businesses in the marine area as a whole?
- What are the most threatening risks to the sustainability of the Blue economy?
- What are the main opportunities for facilitating better performance?

For practical purposes, it might be useful to pay more attention to the 'pessimistic' part of the SWOT analysis, i.e., on analysing weaknesses (internal conflicts or bottlenecks) and threats (external conflicts or risks). By matching and analysing weaknesses and threats in various combinations, it is possible to acquire a better picture of potential hindrances to sustainable development and propose suitable aversion measures. The essential question to be raised and answered in that case should be 'How to avoid or averse the coincidence of a specific weakness (an internal conflict or a bottleneck) and a threat (an external conflict or risk)? Financial and legal aspects are of particular relevance for ensuring sustainable MSP process (Fig./Abb. 2).

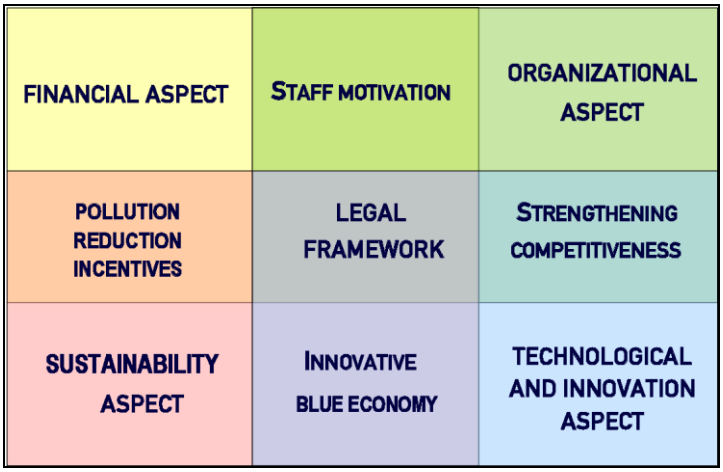

Figure 2: SWOT aspects (drawn by R. Povilanskas)

3 Interactive strategic planning methodology and its application for MSP

3.1 Interactive strategic planning principles

Although the development of a comprehensive strategy is not obligatory as a first part of the maritime spatial planning process, however, the engagement of key stakeholders into the strategic planning exercise from the very beginning can facilitate strengthening horizontal and vertical links of the MSP process. The purpose of the interactive and participatory approach to the MSP process is to ensure that the developed maritime spatial plan is less planner-centred and more stakeholder-centred. As MSP practice throughout Europe shows, the commitment of the critical stakeholders to the final planning outcomes is the key to a 'win-win' decision making and, hence, to the long-term sustainability of the MSP planning outputs.

The primary purpose of the strategy for facilitating the development of a maritime spatial plan is to elicit and connect three main aspects:

1. Area's **mission** – defining the essential criteria for sustainable and integrated management.
2. Area's **vision** describing what stakeholders and interest groups want to achieve

3. Essential **measures** to realise the vision in 5 to 7 years in the form of the proposed list of measure for the statutory maritime spatial plan developed by governmental authorities.

The proposed strategic planning methodology employs an 'emic' approach for a one-time interactive, inclusive workshop, which relies on the following essential principles:

- Considers the planning process from within the social group (i.e., from the perspective of local stakeholders).
- Combines both collaborative and consultative techniques.
- Stresses empathy with the local stakeholders in the target area.
- Facilitates the inclusive collaboration.
- Encourages greater reflexivity, thus giving new insights to inform the local partnerships.

As a result, the emic approach gives 'voice' for the stakeholders themselves. It is not a simple task since the key participants – workshop facilitators and MSP experts must challenge their perceptions and beliefs which may be different from those of the local stakeholders.

3.2 Interactive strategic planning workshop

The essential features of an interactive strategic planning workshop are:

- Duration – 8 hours.
- 6 to 8 participants with an option to go up to 10.
- Two working groups with 3 to 5 participants in one group.
- One facilitator for the whole workshop with a good knowledge on MSP, the target area and an experience in interactive strategic planning.
- Two packs of Post-It sticky notes of each colour – yellow and blue – for each group.
- Flexible to move tables, chairs, panels.
- Natural light in the room.
- Laptop and a multimedia beamer.
- Coffee with snacks at regular intervals and lunch provided at the site.

The workshop should begin with an opening discussion ('reality check') on the Descriptive Part of the MSP strategy provided in advance by professional experts. The facilitator introduces a range of options for sustainable development anchoring the interactive planning on concrete options for development instead of basing the work on abstractions. The facilitator presents these options to workshop participants for 'short-listing' as a SWOT matrix. Then the participants discuss a possible level of support for each option. Any target territory for a maritime spatial plan has finite resources. Therefore, its management should tackle some, rather than all, issues at once.

3.3 Eliciting key human and non-human actors and their functions

The brainstorming method ('Post-It' session) using sticky notes employs a straightforward way to produce a thorough inventory of actors in the marine area. It emphasises creativity and innovation and works best in situations involving complexity, conflict, diversity of people or opinions and short decision-times. The 'Post-It' session helps inventory thinking and allows all participants to work at the same time, thus speeding the meeting and getting everyone involved at once. Furthermore, it makes the participants emotionally engaged since they deliver their insights instead of having other people write or interpret for them. In the process of the session, any ideas are welcome. A superior person has no right to hush a sub-ordinate one, and the analyst should not deride a lay stakeholder's weird vision.

The process in the 'Post-It' session is the following. The facilitator splits the participants into two groups, with stakeholders representing different interest groups divided evenly. The participants must

put down the actors having an impact on the target area on sticky notes of different colours – human actors on yellow and non-human on blue ones – and stick these on their group's workspace poster. The listed actors should be only those that may facilitate or impede sustainable development in the area. The facilitator must encourage the groups to inventory their knowledge. The more wide-ranging is the list of actors associated with the destination, the more time the listing should take. Brainstorming aims at the quantity, which later turns into quality.

Human actors to be listed in the session include public agencies and authorities at local, regional, national and international level, environmental protection specialists, agencies and regulatory bodies, local community representatives, and other interest groups and stakeholders, businesses in all relevant sectors of the Blue economy, external related business enterprises (e.g. transportation companies, tourists and other direct and indirect users of the ecosystem services delivered at the target area for which the participants develop a strategy. The sustainability and environmental integrity of the marine area also depends on' non-human' things: adjacent environments, habitats, living organisms (flora, fauna, fungi and microorganisms), other natural resources, cultural artefacts and technologies.

The proposed interactive planning approach describes the interaction between human entities and non-human entities in the form of the resources on which sustainable development and the Blue economy relies – port infrastructure, underwater cables and pipelines, offshore wind energy parks. In various cases, non-human actors can be more influential and stronger than human ones. When participants come up with the complete list of human actors, as well as non-human things and living organisms, they proceed to the next step, which is eliciting actor-networks, ('aggregation of interests'), their 'flat' assemblages and controversies (Venturini 2012). This approach enables a better understanding of linkages holding together the integrity of the marine area.

The participants should group notes with identified and affined actors, cluster them into assemblages and pinpoint each assemblage by naming it. In the next step, the participants should write the theme titles on bigger cardboards and put the sticky notes with the names of the actors that are critical for sustainable development of the Blue economy centrally on the group's poster. Then all other related actors should be placed around the central ones. Further, the participants identify the links among the actors. Next, by comparing different assemblages, the participants of the workshop have to track and analyse the controversies between the assemblages. A comprehensive picture of assemblages, linkages and controversies should emerge from this interactive brainstorming round.

For instance, in the case of the Curonian Spit as a transboundary UNESCO-listed World Heritage cultural landscape, a seaside resort and a national park, the main contention is between the 2nd assemblage performing the spit as a unique seaside resort and the 3rd one enacting the spit as a national park (Povilanskas et al. 2016). Sufficient site management and conservation regulations are in place given that the Curonian Spit enjoys comprehensive protection as a national park. However, there is constant pressure from the local community and from tourism business to renegotiate and transgress restrictions and regulations.

In the next step, the participants attribute critical roles to the actors within each hybrid assemblage which fall into four broad groups:

- Functional nodes.
- Mediation channels.
- Spokespersons.
- Ordinary actors.

Functional nodes are the most important actors on which the integrity, strength and sustainability of the actor-network rely. They may play three interchangeable roles as:

- Centres of calculation.
- Knowledge repositories.

- Obligatory passage points.

A **centre of calculation** is a central actor of an actor-network that mobilises and manages a variety of factors, resources, and interests, thus strengthening and representing the actor-network. It can be an institution, a partnership, or even a smart online collaboration platform. It is a networked entity able to act effectively on many other fragmented areas and entities. The main task of the centre of calculation is to hold together all the other actors for positive resolving of controversies and the facilitation of sustainable development and balanced MSP. For maritime territories, the ministries of environment or their authorised institutions with marine management powers can be the best centres of calculation.

A **knowledge repository** is an entity, an information system or an institution that stores, processes, and delivers knowledge to other key actors, first of all, to the centre of calculation, which is necessary for the efforts of planning and managing various sectors of the Blue economy sustainably. There can be several knowledge repositories within the same maritime territory. They can carry out their research or accumulate and structure the knowledge gathered by other institutions. Academic institutions occupy a central place and usually are the most competent knowledge repositories. They can best collect, collate, systematise and deliver knowledge and information necessary for MSP.

An **obligatory passage point** is a focal position in and around the target area (both in a horizontal and vertical sense). It is a point through which actors have to pass due to the institutional and governance arrangement. It is a condition of the place, action, personality, or entity, which the MSP process must fulfil (pass, visit, perform, overcome, please, satisfy) to reach its goal. Obligatory passage points have a designated unique ability to make oneself indispensable, occupying privileged positions. They might function not only as facilitators but also as bottlenecks dominating MSP and Blue growth discourses.

3.4 Setting the common vision, goals, objectives and measures

The interactive exercise has elicited the most important thematic assemblages of actors and identified their most critical controversies. Now, the participants of the workshop are ready to create a strategic plan for the development of a comprehensive strategy based on identified linkages and key actors' roles. The strategy shouldn't be overly sophisticated. The more concise the strategy is, the more likely stakeholders are to accept it. Strategic planning is a systematic process that enables setting a vision for sustainable Blue growth as a critical idea of the considered target marine area and determining how to achieve it.

The comprehensive MSP strategy for a marine area has to help the centre of calculation accomplish its mission, vision, goals and objectives. It aims to overcome the controversies and to achieve its goals, building on its strengths and opportunities. It is straightforward in setting out the issues, challenges, objectives, risks, roles and responsibilities of the actors. The comprehensive MSP strategy addresses a vision based on the aspirations of the stakeholders. Furthermore, the comprehensive MSP strategy makes it better for people to appreciate the Blue growth principles more efficiently, delivering outcomes anticipated by the local community. It also considers future pessimistic, optimistic and realistic scenarios and assesses the costs of achieving various goals.

Harmonising shorter-term issues with longer-term strategic opportunities and challenges is a critical pre-condition for the successful MSP process. Different issues should render the goals for sustainable development and Blue growth presented in the strategy sub-divided into objectives (critical qualitative and quantitative targets) and concrete actions. The issue-specific definition of specific steps depends on the measures chosen to achieve the goal. The description of human and non-human actors makes it clear how best to accomplish the strategy. Human actors must realise how they might benefit from supporting it.

The comprehensive MSP strategy should consider future pessimistic, optimistic and realistic scenarios. It is easily achievable in the following way: each (eventually realised) opportunity from the accomplished SWOT analysis represents a notion in the optimistic scenario while each (eventually realised) threat represents a notion in the pessimistic scenario. Naturally, a realistic scenario is a kind

of an intermediate version between optimistic and pessimistic ones, i.e., somewhere in between the realised opportunities and threats. However, in each specific case, the realistic notion might be either closer to the pessimistic notion or the optimistic one.

GOAA planning matrix

Aspect (issue to be solved for achieving the vision, e.g., a controversy):				
Goal (formulated in an infinitive form, e.g., to ...):				
Objectives (main qualitative and quantitative targets to achieve the goal): 1. 2.				
Actions: 1. 2. 3.				Cost
Roles	Centre of Calculation	Obligatory passage point	Knowledge repository	Facilitators
Human actors				
Non-human and intangible actors				

Figure 3: The GOAA (Goals, Objectives, Actions and Actors) matrix (drawn by R. Povilanskas)

For example, an opportunity / optimistic notion identified by the participants was that due to the implemented Paris Agreement on Climate Change, the annual sea-level rise would not exceed 1 mm. A matching threat / pessimistic notion was that the annual sea level rise of more than 3 mm, then, the most probable realistic notion is to consider that the annual sea level rise should not necessarily be 2 mm, but rather closer to 3 mm (e.g., 2.5 mm). The realistic scenario represents a '0' option of the strategic plan, i.e., what would happen if we did not do anything proactively ('business as usual').

In the proposed interactive strategic planning methodology, the goals, objectives, actions (measures) and actors relate in a GOAA (Goals, Objectives, Actions and Actors) matrix (Fig./Abb. 3). It is the ultimate result of the interactive strategic planning workshop. The participants present the GOAA matrix on specially designed sheets. Each sheet is addressing one goal which, in its turn, is aimed to tackle one controversy elicited in the first part of the interactive workshop. The implementation of all suggested GOAA measures should tackle all elicited controversies for all relevant actor-network layers and allow to achieve the sought vision.

The participants then rank their GOAA sheets with stick dots in terms of their consistency with the favoured future vision identified earlier in the workshop. This process will produce a 'shortlist' of preferred goals and respective measures. The plan with goals and measures ranked in this way represents three alternatives – the mentioned above '0' option, as well as the moderate and the full-

scale ones – within the framework of quantitative targets and actions. A full list of measures represents a full-scale version of the plan, whereas the shortlist version represents a moderate version of the plan.

Assessing the suggested planning alternatives (i.e., '0', moderate and full-scale) regarding the set of feasibility criteria (typically, 6–10) is the last activity of the interactive strategic exercise. The participants of the workshop make a decision based on their subjective understanding of the criteria and introduce weighting factors to the criteria based on their breakthrough potential and the severity of related risks. These weighting factors are given below in the description of the feasibility criteria. The participants can shorten the list of criteria, introduce additional criteria and change or eliminate the weighting factors.

We suggest the following criteria for comparing planning and management alternatives:

- ***Efficiency*** (weighting factor is **2.0**). The first step is to assess which alternative will deliver the most significant sustainable Blue growth breakthrough.
- ***Socio-economic acceptability*** (w.f. is **3.0**). It is necessary to assess which alternative is the best to achieve long term sustainability goals.
- ***Technical feasibility*** (w.f. is **1.5**). If the alternative requires new technology, then the degree of its uncertainty is high, and the likelihood of successful implementation is rather low.
- ***Policy feasibility*** (w.f. is **1.0**). Unacceptable alternatives that violate the principles of sustainable development decrease the feasibility of the policy.
- ***Suitability*** (w.f. is **1.5**). An alternative that has a narrower impact range than one whose results cover very different areas is more acceptable.
- ***Reliability*** (w.f. is **2.0**). Will the implementation of the alternative bring the expected results and the improvement outlined at the outset of the plan?
- ***Prevalence*** (w.f. is **1.0**). The alternative that best fits the prevailing public opinion is often preferred.
- ***Flexibility*** (w.f. is **3.0**). Is the alternative suitable for solving the issues even as circumstances change, new circumstances become evident, new knowledge is acquired, the situation changes?
- ***Smoothness*** (w.f. is **2.0**). It assesses the length of time between the adoption and implementation of the plan.
- ***Implementation costs*** (w.f. is **4.0**). Usually play a decisive role in choosing the most appropriate alternative.

At the public meetings and discussions with stakeholders during public hearings of the drafted statutory maritime spatial plan, the participants at the interactive workshop should act as promoters of the plan in the measures anticipated in the plan are coherent with the results of their work. Essential local, regional and national stakeholders must commit to the process of implementing the plan as a result. If not, they may ignore the principles of MSP, or dispute the validity of the statutory maritime spatial plan later in the process. Even if all interest groups cannot agree, they will need to see the basis on which the centre of calculation makes planning decisions.

4 Summing-up

The strategy is a document that should be revised regularly to reflect changes within the marine area, the Blue economy, and the needs of coastal community. At least once in two years, stakeholders should compare progress with the goals of the plan and feed in new evidence on the issues. Future-proofing is very critical. The strategy should not be overly sophisticated. The more concise the strategy is, the more likely other people will accept it. Strategic planning is always a work in progress, continually evolving to reflect the challenges faced by the destination. Knowledge is never perfect or finished. It is the process of learning and finding the information that matters.

A marine area or an entire maritime territory can serve as a space for sustainable Blue growth if one promoter acts as a centre of calculation while several facilitators gather around her serving as knowledge repositories or obligatory passage points. Existing actors might have insufficient capacities to function as centres of calculation or knowledge repositories, particularly, in peripheral maritime regions. Then it is necessary to fill in the gaps by engaging external actors or by empowering local actors to accomplish missing functions. The participants of the proposed interactive strategic planning workshop interlink the goals, objectives, actions (measures) and actors in a GOAA (Goals, Objectives, Actions and Actors) matrix. It is the ultimate result of the interactive brainstorming and strategic planning workshop.

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Maritime Tourism in Lithuania and Geographical Information Systems

1 Introduction

Maritime territories are complex places. They are physically dynamic, subject to multiple resource demands, carry risk for coastal populations, and are ecologically very important. The maritime areas of Northern Europe face particular challenges related to the management of spatial resources at the coast, including depopulation, increased tourism pressure, economic restructuring, and a legacy of pollution from the 1980s and 1990s. The complexity of coastal zones and marine areas makes them inherently difficult to manage, however, good quality and timely information can assist better decisions. It places a particular importance on managing information for those tasked with making key decisions about coastal zones and marine areas.

Geographic Information Systems (GIS) are decision-support systems that can be used in the management of spatial resources. They reflect many of the underlying principles of MSP: GIS are interdisciplinary and holistic, and facilitate integration of various data and interests. GIS are increasingly seen as a key tool in the preparation, delivery and monitoring of MSP programmes. The use of GIS for MSP offers several benefits, in particular:

- Convenient technology to store and manage large sets of spatial data;
- Effective tool to identify spatial relationships and patterns;
- Recognised methodology to assist in decision-making;
- Mechanism for the production of high-quality maps.

More generally, GIS can facilitate improved use of information to inform management decisions. Specific uses for GIS in MSP programmes might include:

- Conflict mapping;
- Development planning;
- Hazard management;
- Environmental Impact Assessment;
- Facilitating public participation.

In fact, a GIS can be used to assist in any situation in which spatial data is important. However, GIS also have inherent problems, which need to be addressed by GIS users to avoid misleading analysis. Typical problems might include:

- Collecting accurate spatial data;
- Deciding on the format of data;
- Entering the data into the GIS;
- Maintaining data quality;
- Integrating a GIS into a decision-making process.

2 Conceptualization

GIS has developed rapidly over the last 40 years to become one of the most important tools at the disposal of maritime planners. Key innovations in a variety of disciplines have facilitated the development of GIS, including computer science, database systems, image processing, and remote sensing. At first, GIS were developed to address specific problems, such as the Canada Geographic Information System developed to address large-scale land use planning concerns. These systems were unique, ex-

pensive, difficult to use and allowed only limited data transfer. As the GIS market expanded throughout the 1980s to 2000s, commercial companies developed generic systems that were easy to use, and allowed the incorporation of data from a wide variety of sources.

In parallel with the development of GIS, the development of Remote Sensing technology took place, most notably aerial photography and satellite imagery. Remotely sensed data is now available relatively cheaply and easily via the Internet and is a key source of the data for the inclusion in GIS. Wright & Bartlett (1999, p. 309) stated that maritime GIS faced "the challenges of representing a highly dynamic, multi-dimensional, fuzzy-bounded environment". Currently, the greatest challenges to the use of GIS for MSP are:

- Lack of regular sources of data on some issues (e.g., deep-water bottom habitats or chemical composition of marine and, particularly, estuarine water);
- Acquisition cost of high-resolution remote sensing data of vast maritime areas still remaining very high, especially, if the remote sensing data is needed on regular basis;
- Limited cross-institutional and cross-border integration of spatial data on a more detailed scale;
- Commercialisation of GIS and access to the cutting-edge spatial and 3D analytical models (especially in hydrography and oceanography).

Despite these challenges, GIS use in the maritime territories is set to increase for several reasons:

- Need for spatial data to make management decisions;
- Cost of on-site research using research vessels and stationary gauges (especially in hydrography and oceanography) being expensive;
- Necessity for finding spatial and economic trade-offs for poising the needs of the Blue Growth and marine nature conservation;
- Displaying data to improve understanding of marine ecosystem services and their spatial distribution;
- Integrating the national MSP interests with international obligations for saving the marine environment from irreversible pollution and anthropogenic impact.

2.1 Applications of GIS in MSP

There are also a number of constraints, or potential problems, which can undermine the quality of any GIS analysis. These include:

- Quality of the data;
- Availability of data;
- Cost of hardware and software;
- Cost of data;
- Level of training of the user.

This section seeks to help trainees consider how to maximise the benefits through minimising the constraints. The implementation of a GIS to assist with decision-making needs to be considered carefully to ensure that the maximum data quality is maintained throughout the decision loop. The following issues are important to consider:

- Complexity of the reality being mapped;
- Organisational considerations including personnel and training needs;
- Data quality;
- Source data;
- Time.

Jurkus et al. (2021) identify seven 'facts of life' with respect to information for marine and coastal decision-making:

1. No analysis for MSP can include *all* data and/or analyse *all* alternatives;
2. There are *physical* and *psychological* limits to human capacity as a decision-maker (*bounded rationality*) and too much information obscures the trade-offs involved;
3. Eliciting and prioritizing of the key topics and issues is *subjective*;
4. Only a *limited amount of data* can be presented at any one time, due to:
   - complexities of marine ecosystems;
   - complexities of marine decision-making;
   - the multiple use nature of the coast.
5. The *format* used to present results will affect:
   - the amount of data that can be presented;
   - the extent to which the data can be understood.
6. Selection bias (pure *randomization of data* is difficult to achieve) is omnipresent.
7. Without appropriate understanding of GIS data management processes and GIS output, decisions assisted by GIS can be flawed or inappropriate.

3 GIS project management in maritime tourism and marine nature conservation

3.1 Procedures

In order to increase the probability of successfully implementing GIS for a specific project, a strategy should be developed which takes into account all the elements of the decision loop in order that data quality is maintained and decision quality optimised. A typical GIS project progression is as follows:

1. **Determine the aim of the study:**
   - Define the required outcome of the project;
   - State clearly the objectives of the project;
   - Identify an area of the project and its boundaries.
2. **Identify data needs:**
   - Construct the model of reality;
   - Identify the need of appropriate data to make an informed and strategic decision;
   - Identify the sources of the required data.
3. **Prepare a plan of GIS use (sometimes called a Cartographic Model):**
   - A flow diagram charting the datasets to be used and the analytical techniques to be applied;
   - Set conditions for quality assurance to provide a record of what analysis was undertaken;
   - Prepare a GIS project log.
4. **Assemble the required data:**
   - Collect new data;
   - Quarry archive data;
   - Assess if the quality of the data is appropriate to the study;
   - Consider what data management is needed to maintain data quality.

5. **Enter the data into the GIS:**
   - Choose the data entry method;
   - Data sensitivity analysis - consider an impact of data quality in the final result.
6. **Interrogate the GIS:**
   - Minimise the impact of data error on the project;
   - Query the system to gain an output;
   - Decide upon the rendering and presentation of the outputs.
7. **Make decision:**
   - System identifies potential sites;
   - Decision-based on other factors;
   - Value judgments.

It is important that data quality is appropriate to the level of the decision being made. If data quality is too low, the decision will be sub-optimal. At each stage in a GIS project there is scope to weaken data quality. Therefore, the project must be carefully managed to maintain appropriate data quality. In maritime territories, because the elements being mapped may be more complex, the importance of data quality is likely to be enhanced. Finally, it is important to consider the practicalities of setting up a GIS. Today, GIS software packages can be bought 'off the shelf'. These are empty of data, but otherwise ready to use.

Once you have entered the data you require, the GIS can begin to help you make better decisions. To run modern GIS packages requires relatively little specialist equipment to gain immediate benefit from its use. A good standard personal computer is the major expense and most important requirement. The two main considerations to make with regard to the specification of the computer are memory capacity and processing speed. The larger the memory, the more data it can hold, and shorter processing times reduce analysis time.

With any of these data sets, it is important that you make sure the accuracy of the spatial component of the data is good enough for the study. It is also important to get a temporal fix to appreciate when the data is valid (e.g., swimming is probably only a summer activity). With existing maps there may also be copyright restrictions on their use, so check before using them.

To enable combining data and maps, comparing of different maps and charts regarding their suitability for the use in a GIS is indispensable. The GIS enables to link data of all different kinds to areas, lines and points on maps. It enables the combining or comparing of maps and producing new maps. For example, by combining several GIS layers, an expert gets a possibility for the comparison of land use and the ecological value and sensitivity of a marine area to identify possible conflicts of interests.

3.2 Quality assurance

One of the main challenges of maintaining maximum data quality throughout the GIS decision loop is data quality assurance. There are several stages in which data quality can be compromised:

1. **Original data collection:**

Data from members of the user groups may not be reliable. Each user may perceive 'conflict' differently and so provide inconsistent data. This is an important issue, as once the data is collected, it is impossible to improve its quality.

2. Data input to the GIS:

There are a variety of methods of inputting the data to the GIS (Fig. 3). Each has inherent advantages and disadvantages and the appropriate method must be identified in order to minimise the risk of compromising data quality.

3. Data analysis:

Any manipulation of the data within the GIS may negatively influence data quality. Particular risks include changing map projections, modifying the scale of data and overlaying inconsistent data layers.

4. Presentation of data:

The style of data output can influence the perceived importance of the results. For example, if the areas of conflict were coloured red, they may be treated differently than if the areas of conflict were coloured grey or green. It is important to recognise that the way in which GIS data is presented can influence the outcome of the decision to be made.

This challenge is typical of the use of GIS in MSP where data is often of uncertain quality and the GIS output is required to make specific management decisions. The role of GIS is to help make better decisions than would otherwise be the case. Therefore, a careful management of data and data quality is very important. There is a clear connection in the GIS decision loop between all components of the loop. If either data collection or the use of the GIS are in any way sub-optimal, then it is likely that the final decision will also be sub-optimal. This is why GIS is so important to the implementation of MSP programmes.

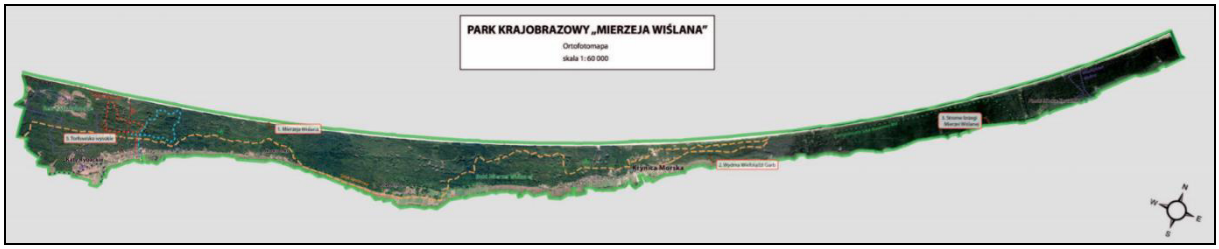

Figure 3: GIS data input from an orthophoto – Vistula Spit Landscape Park (Source: https://www.pgi.gov.pl/)

4 Case study: GIS for Conservation Planning in Seaside Regional Park (Lithuania)

Aim: to identify zones of potential conservation conflict in maritime territories designated as protected coastal and marine areas within Seaside Regional Park, Lithuania (Fig. 4).

Data needs: The most relevant resource and activity digital maps for Karklė Marine Reserve and the adjacent coastal area are produced using GIS software ArcGIS® by ESRI™:

1. Distribution of fish and benthic communities;
2. Endangered, rare or protected species distribution and significant sites;
3. Significant colonies of breeding and wintering birds;
4. Fisheries' sites (artisanal, commercial and recreational);
5. Tourist developments including camping;
6. Borders of functional zones of Seaside Regional Park;
7. Bathing water quality in the nearshore;
8. Beaches and other areas designated for outdoor recreation and tourism;
9. Adjacent coastal and inland land use.

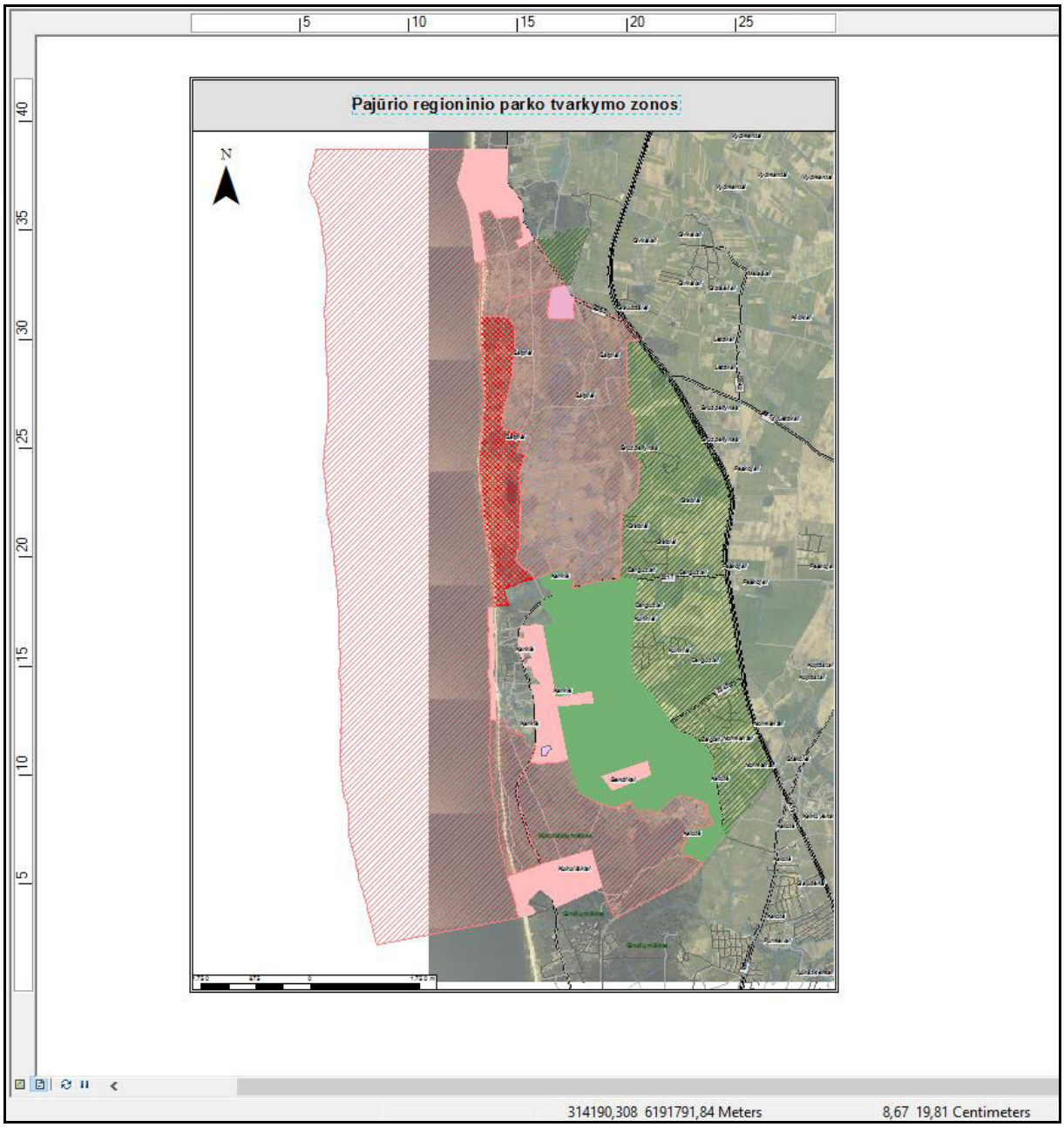

Figure 4: GIS map of functional zoning of Seaside Regional Park (plotted by Egidijus Jurkus)

Assemble data: To collect all relevant data, various spatial information sources are used – from the national GIS database to available maps and written sources, to own data collected during the field surveys (Povilanskas et al. 2015). The data which is necessary for creating GIS maps is spatial, so existing maps would be a good place to start (Povilanskas et al 2013). In particular, suitable spatial data sources are:

- Topographic maps;
- Hydrographic charts;
- Arial photographs showing use activities;
- Observation / survey - to see where use occurs;
- Interview surveys with users to discover where they undertake their activity.

Ground truthing: This phase of the GIS project includes field trips into the target area in Seaside Regional Park. It covers an area of 31 sq. km of Karklė Marine Reserve and the adjacent coastline from the administrative boundary of Klaipeda City to Nemirseta within Palanga Township. Participants (trainees) in the mapping trips included the project leader (a GIS and mapping specialist from an academic institution), Seaside Regional Park rangers and other staff members, and occasional volunteer support from local NGOs.

GPS points taken during the fieldwork are plotted on a GIS system, using the map of Seaside Regional Park's coastline quarried from the national database of the state parks and other protected areas of Lithuania. The GPS points were taken offshore, perpendicular to the relevant point on the coastline, and were then manually aligned ("snapped") to the coastline using the GIS system. The participants labelled each section with an identification number linking it to its corresponding datasheet.

In the GIS, the Karklė Marine Reserve sections were joined to the appropriate data tables in a separate database to supply details such as ecosystem type, disturbance levels. Shapefiles were then exported from these joined feature classes and database tables, incorporating static versions of the gathered data linked to the appropriate coastline segments. These stand-alone shapefiles can be viewed and queried in any standard GIS system without the need for access to the original databases. In this way, the fieldwork enabled gathering information not available by remote sensing or other off-site methods and validating the GIS dataset when necessary.

Enter data into the GIS using appropriate methods. It varies according to the data source, but typically includes digital topographical maps and remote sensing data and the scanned and manually digitised maps and charts. The trainees rendered the map layers in the form of the P-S-I-R model (Pressure-State-Impact-Response), widely used in marine protected area management (Kelleher, 1999). These indicators presented in the GIS reflect spatial variations in the protected area. The specific task was to use diverse data to create GIS layers on the location of relevant resources and limitations. The group performed overlay analyses to identify a suitable set of sites with tourism attractions and nature values (protected coastal and marine areas, coastal landscapes and recreational sites).

Model: each set of location data is stored as an individual data layer. The trainees overlayed them to reveal where the areas of overlap are. Overlay mapping and GIS are methods for identifying the spatial distribution of impacts. Both methods involve the preparation of maps or layers of information that are then super-imposed on one another. The areas of particular interest were the places of overlapping different priorities. However, it is important to note that they may not be the same as areas in which conflicts occurs. This information needs further interpretation to be useful.

Interrogate the GIS: trainees used appropriate aspects of the GIS software to derive images showing overlapping areas (indicative of conflict). Recent developments in GIS have opened the opportunity to identify spatial clusters of tourism sites and services and determine tourism hotspots based on quali-quantitative information from diverse sources (De Valck et al. 2016). The GIS data layers generated from the fieldwork and remote sensing data, overlaying and statistical modelling, became the basis for iterative adjustment of land use, conservation and tourism management plans in Seaside Regional Park through expert and local review processes.

Identifying the potential conflict zones allowed the trainees to make decisions regarding how the conflict should be tackled. This identification of the zones and types of conflict to be considered will form the basis for future decision-making in the framework of MSP and ICZM. In this way, the tourism conflict map produced (Fig. 5) may become a valid instrument for protecting an area threatened by the urban sprawl in the peri-urban Seaside Regional Park. In the next phase, when all available relevant information will be processed via the GIS, the trainees can apply geostatistical analysis to integrate and validate their interpretations with further quantitative elaborations.

Make a decision: As a result, to compile relevant site information, a GIS inventory was accomplished, preparing a brief project plan concerning the expected outputs. The trainees now have a GIS-based coastal and maritime tourism development plan drafted. It enables to facilitate the management of

Karklė Marine Reserve in the Baltic Sea nearshore. In practice, this plan needs to be more detailed and elaborated more carefully. In particular, the implications of using GIS should be considered concerning the cost of system implementation, data availability and cost, any training requirements, staffing and changes to working patterns that the use of GIS may require.

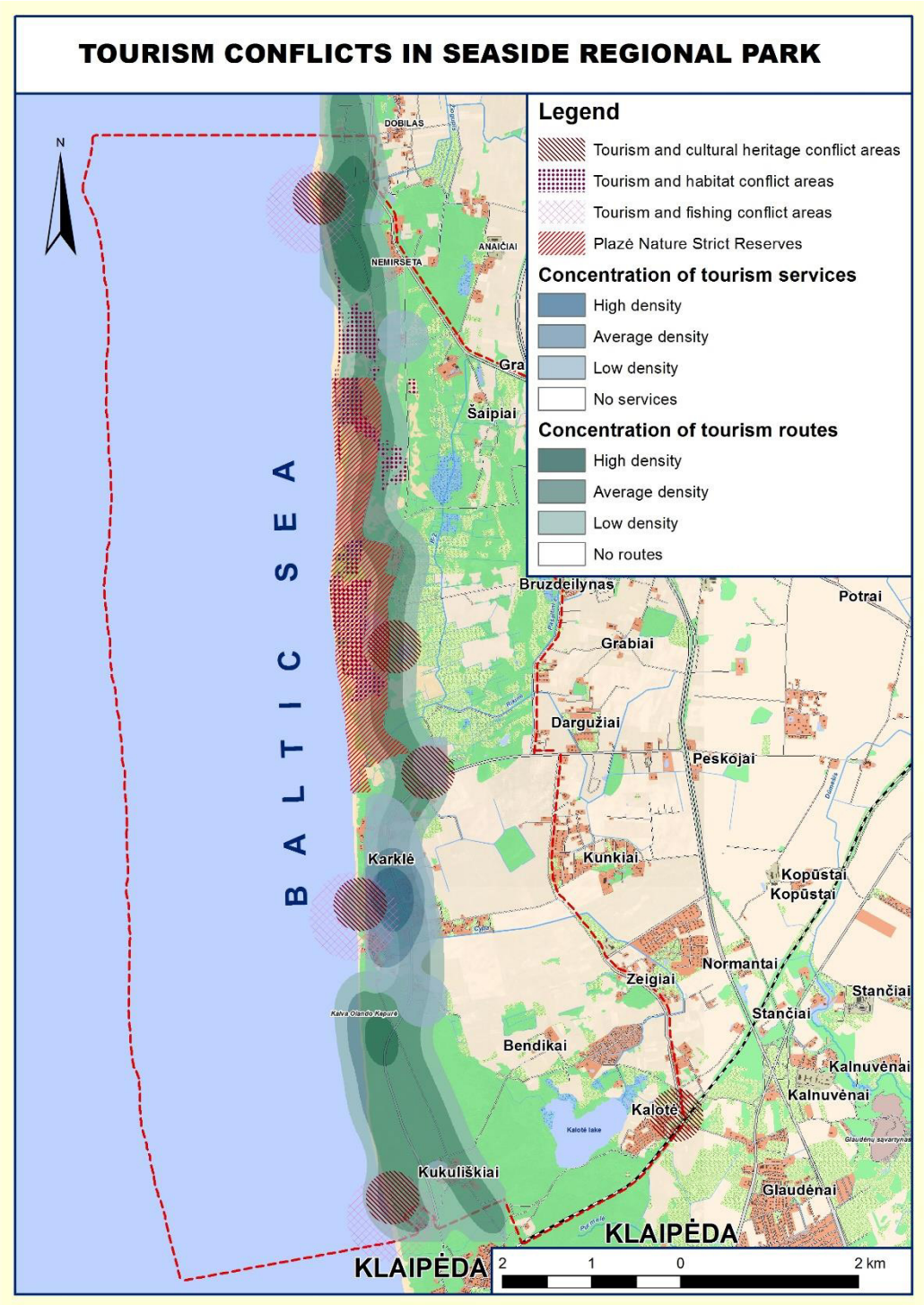

Figure 5: Resulting GIS map of tourism conflicts in the coastal zone of Seaside Regional Park (plotted by Egidijus Jurkus)

5 Summing-up

GIS was applied to help meeting (and illustrating) the MSP requirements of spatial analysis for the interaction of coastal and maritime tourism with the conservation regulations in a marine protected area. There is a general awareness among the MSP experts and scholars of the possibilities for research that comes with the enhanced availability of information that the Internet offers, and the tools of processing vast and diverse spatial data that GIS application offers (Löwenborg 2007). However, according to Visser et al. (2016, p. 14): "Digital natives are used to learning to work with something intuitively, whereas GIS or databases also involve a deeper understanding of the process. It often takes a lot of effort for students to grasp the concepts of these tools, although applying the program often goes very well."

In Seaside Regional Park, GIS, fieldwork, and remote sensing resulted in data collection, processing, and analysing the conflicts between coastal and maritime tourism and marine nature conservation. As a multifaceted investigation object, tourism in protected coastal and marine areas requires a comprehensive and creative approach. GIS brings forward the spatial dimension of environmental data. It facilitates interpreting the dynamic interaction between maritime tourism and marine nature conserveation from several perspectives to promote research methods during the analysis and understanding of sustainable tourism planning design in protected coastal and marine areas. In that context, the increasing use of GIS is an expected development of maritime tourism planning practices and a suitable way of integrating the different tourism development objectives in protected marine and coastal areas.

However, GIS with its broad array of digital maps and charts and geotagged tourist attractions also raises cautions. The spatial data is rendered with a particular purpose and used at a specific scale level. Decisions on generalizations and sampling are also related to the scale. GIS enables presenting and using a dataset at any scale. Hence a necessity to pay attention to the intended scale level in advance (Jurkus et al. 2021). Furthermore, remote sensing and GIS are available for the planning and decision-making processes, but their use might be limited by a scarcity of money, time, and data. Premature application of sophisticated technology may divert scarce resources from on-site conservation efforts (Kelleher 1999).

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