MSP MCH

MARITIME SPATIAL PLANNING FOR MARINE CULTURAL HERITAGE

BUSINESS GAME ON MARITIME SPATIAL PLANNING FOR MARINE CULTURAL HERITAGE

DESCRIPTION OF PLANNING AREA

Developed by

The Scientific and Research Institute of Maritime Spatial Planning Ermak NorthWest (ErmakNW)

based on business games “Maritime spatial planning. If I were a Decision maker!”

and “MSP Challenge”

Interreg Project # R064 BalticRim

Baltic Sea Region Integrated Maritime Cultural Heritage Management

2019

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Map of planning area

The planning area is located somewhere in the Baltic Sea. The adjacent region is a border one; it has both a land and sea border with a neighboring state in the north-northwest. There is a metropolis in transport accessibility but out of the playing field. The marine area is a large gulf, named East Bay, stretching from east to west for about 30 km. There are several islands of different sizes, including those suitable for economic development. Two rivers flow into the bay - Kitezha River and Muddy River.

For several centuries, the local population for living, farming and fishing has used the coastal lands and the East Bay.

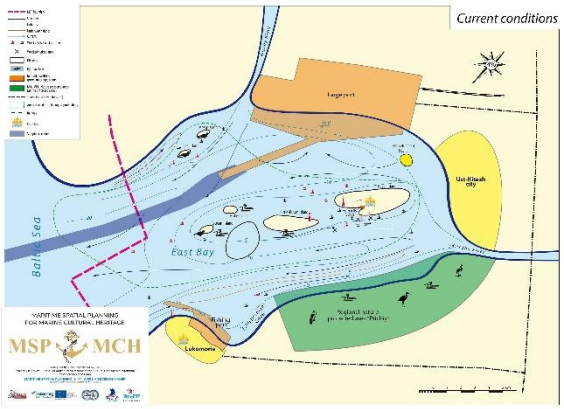


Fig 1 – Current situation

Physical and geographical characteristics

- The climate is marine, mild. The average wind speed in the marine area is 4.5 m/s, with gusts during storms up to 20-25 m/s. In severe winters (on average, every fourth winter) the bay is completely covered with ice, the thickness of which can reach 1 meter. In mild winters, the marine area may not freeze at all or be covered with sludge or separate ice fields up to 20 cm thick. During storms, wind speeds reach 20-25 m/s and waves develop up to 4-5 points at the entrance to the bay (wave height 3-3,5 meters), in the top of the bay, the height of the storm waves decreases to 1,5-2,0 meters. The prevailing wind directions are southwest and northeast.

- The sea is tidal, fluctuations in the level do not exceed 1 meter. The currents in the bay are mainly due to river flows, the main direction is from east to west. In the coastal part and around the islands there is a slight return flow. During strong winds and waves, the pattern of currents can vary greatly depending on the strength and direction of influence of wind and waves.

- Depths in the East Bay smoothly vary from 20 meters at the entrance to 5 meters at the mouths of the rivers. In the center of the bay there is a ridge of hilly islands (archipelago), the depths in the archipelago area do not exceed 5 meters. Between the ridge and the shores of the bay, the water depth reaches 10-15 meters.

- The Kitezha and Muddy Rivers that flow into the East Bay are quite deep and in the Middle Ages were used for shipping to inland ports, which now become the centers of international trade. Rivers practically do not tolerate sediment load, however, intensive economic activity in their upper reaches seriously affected the ecological state of the rivers and the adjacent area of the bay.

- The shores of the East Bay are dune in nature and are overgrown mainly with pine forest, and in some places are swampy. Due to the increase in the number and intensity of storms in recent decades, foredune erosion and coast retreat by 15-25 meters are observed in some places. The upper layer of bottom soils is mainly sandy-silty sediments up to 1-5 meters thick, covering bedrock in the form of alternating sandy, moraine, and clay soils. Along the entire southern coast and, partially, the north, there is an underwater dune with marks minus 3-5 meters.

- About 50 years ago, a large port was built on the northern shore of the East Bay; dredging in the port area to a mark of minus 12 meters was carried out, reaching natural depths. The excavated soil was partially used to form the artificial territory during the construction of berth terminals, and was partially stored in dumps (sea landfills) west of the island ridge. Near the historical settlement of Lukomorie in Fishermans Cove on the southern shore of the East Bay there is a small fishing port; there were also dredging works down to the level of -7 meters.

- The neighboring state is quite friendly, however, during the construction of the port 50 years ago, it protested because the suspension raised during the work caused significant damage to coastal fishing in its waters. Currently, the commercial fish population has fully recovered.

According to a long-term climate forecast, by 2100 sea level rise is expected to be 60-80 cm from the current state. According to experts, this can lead to increased coastal erosion processes and the widespread retreat of the coastline by 30-50 meters. Special (and expensive) measures for bank protection are needed.

The international obligations signed by the country oblige it to establish nature protected areas on not less than 10% of the planning area. Active ecologists demand to increase the area of protected areas up to 15-20%, taking into account the value of the East Bay, its high vulnerability and intensive use.

Population

- In the Middle Ages, the shores of the East Bay were quite densely populated. Bay full of fish and fertile land along its shores provided food to numerous tribes and peoples. Sometimes they were friends, sometimes warring against each other. The bay made it possible to exchange goods with remote countries. Some medieval settlements located on the site of the modern city of Ust-Kitezh, a port on the island of Buyan were part of the Tanseatic League and were centers of international trade. From this and later times, a large number of the wrecks of sunken ships have accumulated at the bottom of the bay.

- Traditional activities of the local population - agriculture and fishing. The creation of the port added a new type of activity and jobs that were occupied mainly by migrant workers who subsequently settled here. The migration flows of recent years have led to the influx of immigrants from other regions, which compensated for the natural population decline. However, the introduction of new technologies at the port leads to job cuts, which has raised the unemployment rate to 12% of the working population; in absolute terms, this is about 1000 people. Region do not has enough objects of social and cultural purpose, transport infrastructure need to be upgraded too. Significant investments are required to undertake these tasks.

- Until the middle of the last century, on the island of Buyan, closest to the mouth of the Kitezha River, there was a fishing village of the same name, in which about 1000 people lived. During the war, the island was home to the hydro airfield, during the air raids, the settlement was destroyed and the island ceased to be a place of permanent residence. The ruins of an old church (historical monument), an old lighthouse, an abandoned cemetery, and the skeletons of ships in the former fishing harbor have been preserved on the island. Near the islands on the seabed are the wrecks of sunken ships both from the time of the WWI and WWII, and from an earlier period, up to the 14-15th centuries of our era. The remains of several hydroplanes are also located there. The territory of the island is very picturesque and is used by the local population and visiting groups for tourism and recreation. In recent years, the island has undergone annual reconstructions of historical battles. The cleaning of the island is carried out by voluntary organizations. An active group of people united in the NGO “Military-Historical Society Our History” is fighting for the restoration of the church and the creation of a natural-cultural tourist cluster on the island, including, among other things, a museum of underwater archeology.

- On the eastern shore of the East Bay, on the banks of the Kitezha River, the city of Ust-Kitezh with a population of 20 thousand people, built for port personnel, is located. In the area of the old fishing port is the old fishing village of Lukomorie, with a population of about 500 people, supporting the historical fishing of the indigenous population. An old church with a graveyard has been preserved in the village, where famous people in the region are buried. Not far from the village, in a rocky massif, there is a cave in which ancient cave paintings are preserved. It attracts many unregulated tourists. Some residents of the village belong to small indigenous peoples protected by international conventions, along with their traditional crafts. Several small villages are located along the banks of the rivers Kitezha and Muddy at a distance of 10-15 km from the mouth.

- The total population in the coastal territory is 22-23 thousand people, of which about 1000 are representatives of indigenous peoples. The age structure of the population tends to age; young people tend to leave these places.

- In connection with a common understanding of the need to improve the ecological health of the region, there is growing concern about the state of the environment. This led to the formation of public environmental organizations (in particular, the NGO “Healthy Sea”), the formation of the environmental asset of the territory.

Environment

Bio and geo-diversity of land and marine area

- 250 species of birds live in the region, 750 species of higher plants and 110 species of moss grow. 15 plant species are on the verge of extinction. The number of protected species includes rare birds - golden eagles, peregrine falcons, black-throated loons, and marine mammals - gray and ringed seals.

- The shores are of pronounced dune character with an increase in the elevations of the peaks of the dunes from 6-15 meters for the first dune to 60-80 for the coastal terrace. Extensive wetlands serving as a nesting site for birds are between the dunes and along the banks of the rivers. Here are places of mass migration and nesting of birds that migrate globally from Northern Siberia to Western Europe and Africa.

- Numerous fish spawn and feed in the area of islands and on coastal shallows, a significant part of which is used for fishing. Herring and sprat are the main local commercial species here. The smelt population, which was the hallmark of local fishing previously, has almost disappeared after the construction of the port, although there has been a recent trend towards its gradual restoration.

- The rookeries of marine mammals are located mainly on the islands. However, after the construction of the port, their number decreased significantly and reached critical values. As fish stocks recover, the seal population is slowly recovering, but is still at risk, owing noise in congested shipping areas.

- Coastal vegetation, especially on the southern swampy coast of the East Bay, has largely remained untouched by civilization. A number of plant species are practically not found in other parts of the Baltic Region.

- Coastal dunes in some places (in particular, almost everywhere along the southern shore of the bay and on its northern shore west of the Muddy River and to the border) have underwater continuation. Such an underwater landscapes in a neighboring state and a number of other Baltic countries have the status of particularly valuable, are protected by relevant laws and are considered highly potential in terms of the development of the Blue economy.

Damaging factors, threats, risks, anthropogenic load

- Industrial and domestic wastewater. The port has a system for treating industrial effluents. In settlements, it does not yet exist; domestic wastewater discharges directly into the marine area. Significant investments are required to create centralized sewage systems and to treat household wastewater in settlements. Sewage from agricultural activities (fertilizers from the fields, runoff from livestock and poultry farms) is usually not treated and together with river

waters enter the East Bay carrying a large amount of phosphates and nitrates. That leads to saturation of the gulf waters with nutrients and an increase overgrowing of the coast seaweed. Several investment projects for the organization of treatment and closed cycles (recycling) of agricultural stocks are considered but require serious governmental support.

- Fuel spills. Emergency fuel spills are generally not observed. The port has OSR units, which allows in case of emergency oil spills to quickly eliminate the consequences. However, with the expansion of port activities and an increase in the density of shipping, a corresponding strengthening of the OSR forces will be required.

- Noises and sounds. With the development of the port, noise pollution in the northern part of the East Bay increased. This led, in particular, a bird nesting reduction and a significant decrease in the number of marine mammals on archipelago.

- Turbidity. During the construction of the port, dredging and the formation of the artificial islands, strong turbidity and pollution of the water with fine fractions of sand and silt were observed. The stain of pollution spread, including to the area of a neighboring country was reflected in fish stocks, which led to a decrease in commercial fishing. As political tension diminishes, environmental issues have occupied an important place in relations between neighboring maritime states. Distribution of the turbidity requires mandatory information; strategic environmental assessment procedures and consultations with a neighboring state (see section International law).

Existing conservation measures

- Before the Large port was developed industrial and domestic wastewater was not treated at all. 10 years ago, a wastewater collection and treatment system was established in the port, but it applies only to the port itself, and not to the city of Ust-Kitezh, where most of the port's personnel live.

- The administration and residents of the city understand the need to create a modern system for collecting and treating wastewater; a project for the construction of treatment facilities has been developed. However, the limited city budget does not make it possible to implement the plan quickly enough - external investments are needed. In smaller settlements, there is no centralized sewage system; septic tanks are used.

- There is an acute problem of agricultural runoff, but agricultural enterprises do not have the incentive and ability to take measures to prevent runoff from rivers and livestock farms from entering the rivers independently.

- Ecological monitoring is carried out in the marine area and on the land in accordance with national and international legislation.

- On the southern shore of the bay from the mouth of the Kitezha River to the eastern border of Fishermans Cove, there is a regional nature protected area «Ptichiy» - bird sanctuary of regional significance. The marine part of the NPA adjoins its coastal area to the level of -5.0 meters. The area of NPA partially is swampy, rare species of mosses and lichens grow here; coastal thickets and reeds serve as nests for birds living in the area and as a resting place for migratory birds. NPA occupies about 4% of the planning area; its marine part is about 3% of the East Bay.

- In recent years population activity increased, including related to environment and nature protection. Several environmental NGO were created, they provide environmental education; organize summer green camps, cleaning beaches and beaches, work with children and young people.

In general, the ecological situation in the bay and on its shores can be considered satisfactory. At the same time, further increase in economic activity may upset the delicate balance, therefore, strict and constant monitoring of the environmental status of the marine area and the implementation of compensation measures to prevent possible damage are necessary.

Economics

Regional budget

Up to half of the regional income is from the port activities and associated enterprises; a small part of revenues comes from the fishing port in the Lukomorie. A significant contribution to the budget is made by agricultural enterprises.

Since the port's cargo turnover began to grow rapidly 15 years ago, the area ceased to be subsidized. However, the regional income is not enough to completely close all existing problems, including costly measures to reconstruct transport infrastructure, modernize public transport, and reconstruct treatment facilities.

Employment

About a quarter of the able-bodied population of the city of Ust-Kitezh are employed in the cargo port or associated enterprises of the “Dry port”. Another 20% work in the service sector. A fishing port, fishing cooperatives and a fish processing enterprise provide income for almost the entire population of Lukomorie, however, in the winter, this marine activities are significantly reduced. A part of the population works at agricultural enterprises, the remaining are officially unemployed (1000 people) or are employed in personal subsidiary plots.

Large enterprises

The most important enterprise for the region is certainly the sea cargo port, which is the main city enterprise for the nearby city of Ust-Kitezh. Despite the past reconstructions, a significant part of cargo transshipment is carried out according to old technologies. The port capacities are insufficient, their significant increase is required (2.5-3 times), and first it is necessary to increase the depths at the berths and in the area of the cargo port.

The fishing port, not claiming large volumes of catching and processing fish, together with fishing cooperatives supports the traditional activities of the indigenous population.

Agricultural enterprises, as a rule, are somewhat distant from the coast of the East Bay, historically gravitate towards villages along riverbanks and provide mainly the local food market.

Hydrocarbon resources

Exploration work carried out in recent years has revealed a rather large oil field between the Scream and Little-Buyan Islands. According to estimates, the explored reserves of the oil field are sufficient to meet the needs of the region in petroleum products for at least 20 years.

Energy

The region does not have its own energy supply capacities. It is supplied with energy by a high-voltage power line. PL is enough to supply all consumers, there is a small margin. However, an increase in consumption of more than 10% will require, at a minimum, the construction of new transformer sub-stations, and if the increase is more than 15%, it will be necessary to reconstruct the power lines or obtain energy from other sources, such as onshore and offshore renewable energy.

Tourism and recreation

Despite the attractive coast, relatively clear sea, the presence of cultural and historical heritage sites, including the marine heritage. Cultural and historical monuments are located both on the coast and on the islands and at the bottom of the bay and are mostly not tidied up. Well-organized tourism is not developed. At the same time, tourism is seen as a promising avenue, since there is a metropolis in transport accessibility, the inhabitants of which can use the tourism opportunities of the region for a weekend tours, more long therapeutic and wellness tours or vacations. The development of yachting tourism is hampered by the lack of marinas and

moorings for small vessels. Cruise tourism also needs cruise infrastructure development and regional brand formation.

Proposals for the development of marine activities (Blue Economy)

General economic trends

The period of economic stagnation is over. In accordance with the country's needs, the need to create new port facilities, primarily for the hydrocarbons (oil, oil products, and liquefied gas) transportation is growing. In addition, container terminals need to be developed. This requires large investments, a substantial increase in revenues to the regional budget, and new well-paid jobs. However, powerful construction will significantly affect the environment, and it may practically negate traditional crafts. The delivery of additional labor will be required, which can fundamentally change the demographic situation and the ethnic composition.

Cities and settlements

Despite the unemployment among the local population, the development of new economic activities on the coastal area will necessitate the importation of additional labor, which will require the development of settlements. Part of the incoming population can be settled in the city of Ust-Kitezh. For the rest, it is proposed to carry out housing construction in the village of Lukomorie or villages located 15-20 km from the coast, with the creation of a modern transport infrastructure. Perhaps, at the same time, Lukomorie will turn from a village into a small city, which is actively opposed by local residents.

Oil production and refining

Oil production is traditionally considered as competitive and favorable for investment. It is proposed to organize oil production from the explored oil field between the Scream and Little-Buyan islands and lay a pipe ashore from the oil production platform to a newly established refinery near the village of Lukomorie.

Archipelago

The islands in the bay, especially the central ridge and primarily the Buyan Island use to attract the attention of investors. Considering their geographical location, there are few proposals

a) to place a natural gas liquefaction plant on the Buyan Island with an LNG terminal for its transportation, as well as a modern container terminal;

b) to create a large international tourist and recreational center on the Buyan Island;

c) to establish federal or international MPA on the islands and around them which will cover significant part of the East Bay.

Port activity

New port facilities require increasing depths at berths up to 15-16 meters. In addition to the proposal for the placement of port terminals on the Buyan Island, there are other proposals for the development of port activities. One of them is the complete modernization of the existing Large port with an increase in depth to 15 meters. Another proposal is to place additional terminals in the area of the Fishermans Cove, partially cutting off the existing regional NPA "Ptichiy". Both proposals significantly affect the objects of marine cultural heritage. Another option is to upgrade existing port, but it will cause a temporary reduction in current cargo turnover due to the need for construction work.

Nevertheless, federal interests require new port facilities to be created in the near future while maintaining the existing port cargo turnover.

Of particular difficulty is the need to bury the soil extracted during dredging (underwater landfills), since

1) the turbidity of the water resulting from this has a bad effect on the reproduction of fish stocks and, in addition, can reach the borders of the neighboring state;

2) locating the places for soil discharge require additional research, for example – UCH revealing and measures to preserve it.

Marine linear infrastructure

All options for the development of the archipelago require the formation of a linear infrastructure. In the case of a MPA (option c), this will be at least a power cable to supply islands with energy, while offshore wind farm creation is possible too.

For port terminals (option a), the construction of a highway, railway, gas pipeline, and power cable to Buyan Island will be required. The tourist and recreational complex (option b) needs to create modern hotel facilities on the island, a berth for cruise ships, a heliport and a motorway connection with the coast.

Rail and road links of Buyan Island with the coast can be achieved through the construction of a bridge(s) or tunnel(s).

Offshore wind energy

The average wind speed in the marine area is sufficient for the wind generation to be economically viable, especially if the wind farms are established close to the shore at shallow depths. However, offshore wind facilities may limit some other marine uses - shipping, fishing, and nature conservation. For the contribution of wind power to the balance of energy supply to be tangible (5% or more), the area of wind farms should be at least 100 hectares; to meet the needs of the new port, wind parks should be at least 600 hectares.

It should be borne in mind that on average over 4% of the time there is no wind. Another risk factor for the development of wind energy are bird flight routes, data on which have not been sufficiently studied on a moment.

Fisheries and mariculture

The development of port activities can (and certainly will) do serious damage to the fishing industry. In this regard, the indigenous population (protected by international convention) is actively opposed to any serious blue economy development. One possible compromise is to re-equip the fishing fleet (at the expense of port investors) to ensure fishing in remote areas of the sea.

There is also a proposal to place aquaculture farms for farm fish and other seafood production near the Fishermans Cove. This proposal is quite popular, but mostly fishing men work on fishing vessels, and women work at aquaculture and fish processing enterprises, so reorientation to these types of industries will lead to a change in the gender composition of local employment.

Proposals for NPA and MPA

The shallow areas of the bay around the archipelago and near the coasts are overgrown with aquatic vegetation. The water warms up there, which attracts fish for spawning and rearing juveniles. This, in turn, attracts waterfowl, some of which nest here, migratory birds use the area

for seasonal parking and feeding. In connection with these, a solution arises (and ecologists are already advocating this idea) to establish protected areas with the status of, for example, a natural park around the archipelago from Scream Island to Buyan Island. This will make it possible to bring the protected areas to the required 10%; however, it significantly reduces the possibilities for the development of other marine activities and, in particular, offshore wind energy.

Marine cultural heritage

Experts offer several proposals connected with MCH:

a) to create a museum of underwater archeology on the island of Buyan as part of the tourist and recreational cluster. For this, it is proposed to use the preserved building of the former lighthouse and a church with a graveyard. The Friendly cove can be fenced off from the sea by a dam and drained. In it, according to the idea of the authors of the proposal, the remains of ancient ships extracted from seabed and preserved can be transferred; some of them can be placed in a special underwater storage with glass walls and a ceiling;

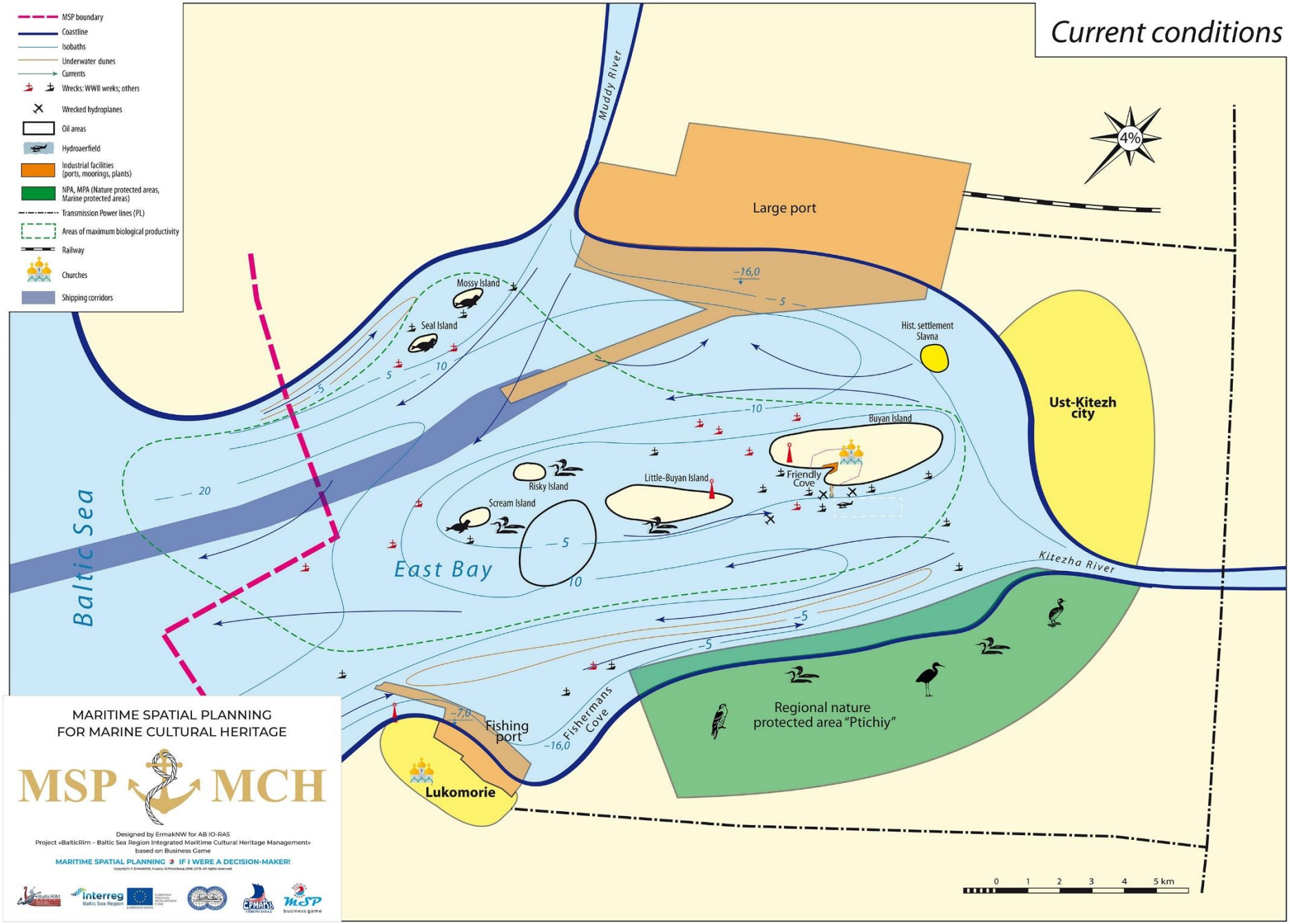
b) to create the maritime museum in the village of Lukomorie on the shore of Fishermans Cove with the organization of diving visits to underwater heritage objects – vessels that died in the WWI and WWII wars. The tour route can include the ruins of the old lighthouse and church;

c) to preserve the wrecks of vessels the rise of which is undesirable or impossible on the seabed with establishing special status and restrictions for such a locations;

d) to continue the search for the remains of the historical settlement of Slavna in the shallow waters near the city of Ust-Kitezh;

e) to take measures to preserve wrecks of dead ships and airplanes of WWII, which in 20-25 years will also become marine cultural heritage objects;

f) to give the status of a protected landscape to underwater dunes in order to avoid damage (destruction) in the process of growing anthropogenic activities.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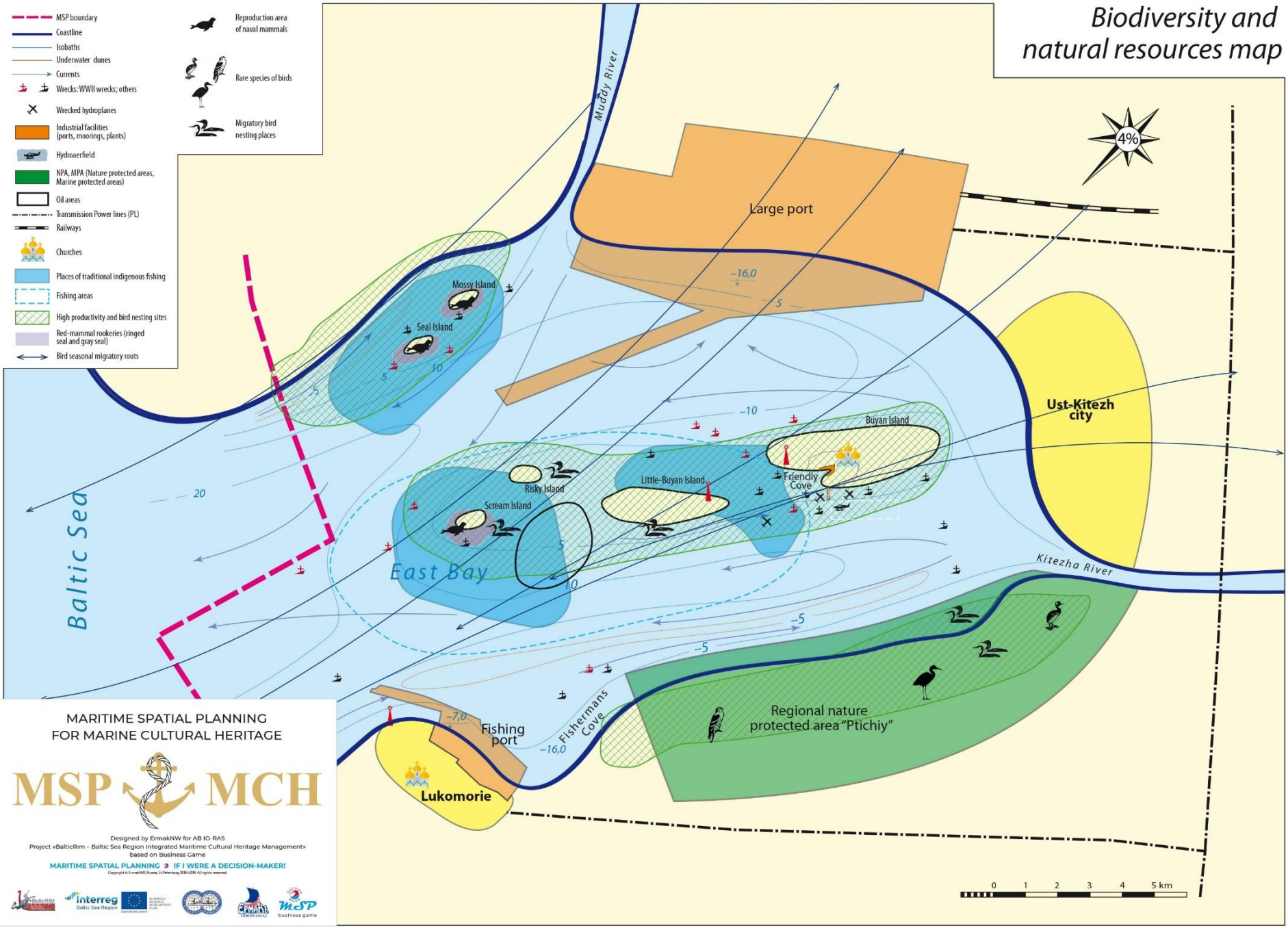
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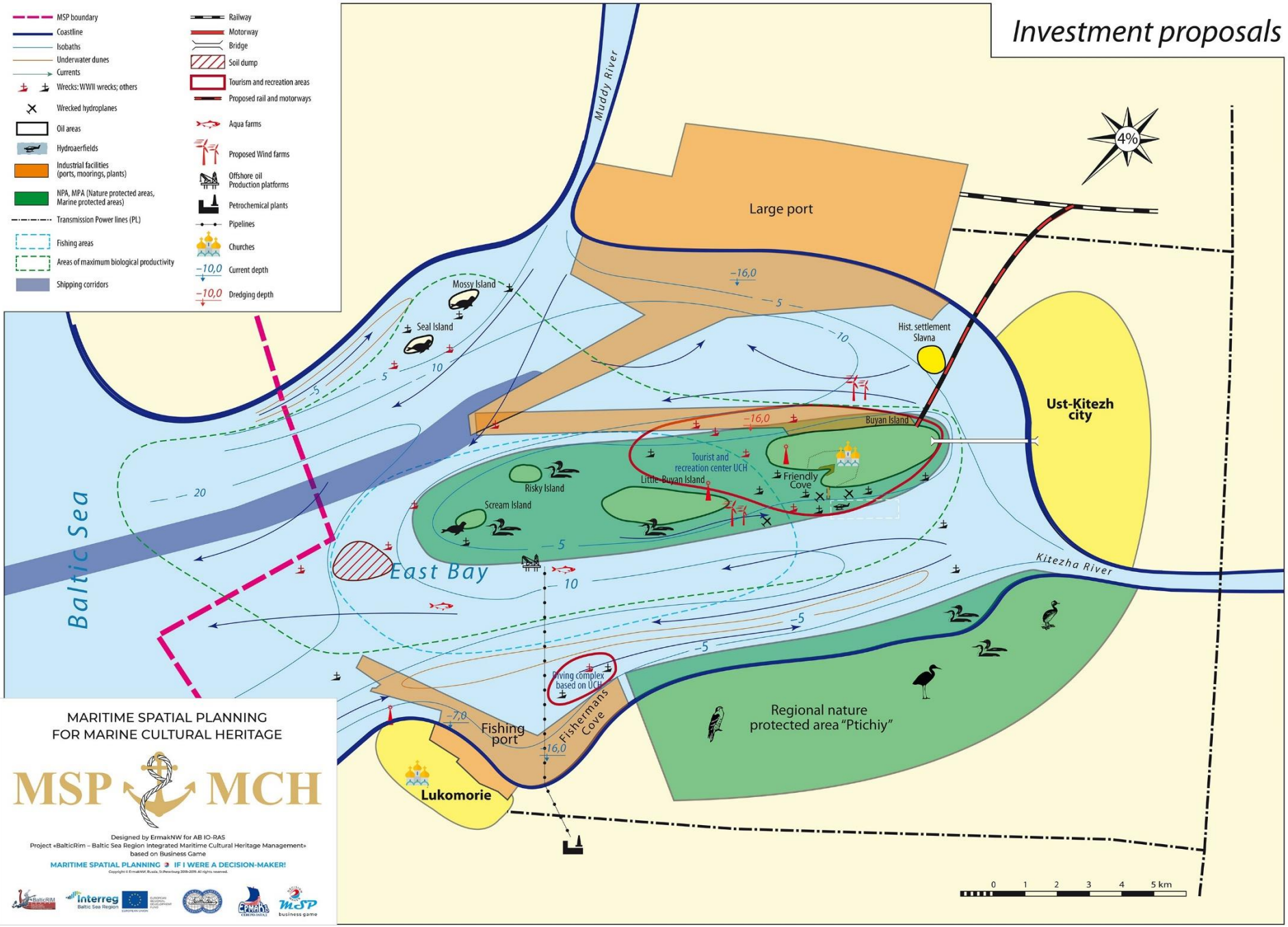
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