Pilot Activity	'Comprehensive environmental study of marine and coastal areas of the Curonian Spit National Park for granting these areas the legal status of a marine protected zone'. *(Development of the maritime specially protected area in the Baltic Sea through expansion of the Curonian Spit National Park by accession of the adjacent water area for maintaining environmental stability in the Southern Baltic Sea)*
Implemented by (Main Consultant)	Ecological Monitoring, Management, Audit and Consulting» (EcoMMAK)
Authors of the report	July Dobrushin, Armen Grigoryan, Stanislav Babich, Sergey Kondratenko, Liudmila Poplavskaia, Yulia Shidlovskaya, Irina Zhukovskaya, Oleg Rylkow, Elena Ezova, Alexey Guzsin, Gennady Grishanov
Report compiled by	July Dobrushin, Armen Grigoryan, Stanislav Babich, Sergey Kondratenko
The following organizations have participated in the compilation of this report	The Biodiversity Conservation Center, LTD Ecological Monitoring, Management, Audit and Consulting
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BASE Implementation of the Baltic Sea Action Plan in Russia

Comprehensive environmental study of marine and coastal areas of the Curonian Spit National Park for granting these areas the legal status of a marine protected zone.

Kaliningrad
2014

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EXECUTIVE SUMMARY

Introduction

The purpose of this study is to substantiate granting the legal status of the protection zone to the sea areas adjacent to the boundaries of the Curonian Spit National Park aimed at preservation of the ecological integrity of the National Park natural complexes and maintenance of biological diversity in the southern Baltic Sea.

1. Brief characteristics of the Curonian Spit National Park

This section includes information about geographical location of the Curonian Spit, its physical and geographical conditions, structure and history of its formation, natural territorial complexes, flora and vegetation, fauna, current state of ecosystems.

1.1. Activities of the National Park

Here presented organization of the territory and regime of the National Park, inspection service, research, educational and recreational activities, financial and material-technical basis, role and functioning of the Curonian Spit National Park in the terms of ecology and economics within the region and the Russian Federation, characteristics of the object of the UNESCO World Heritage.

2. Characteristics of the territories (water areas) proposed for inclusion into protected zone

2.1. Characteristics of the natural complexes, components and objects

Information about relief and geological structure future protected zone, climatic features and ice-hydrological conditions, marine bottom communities and their role in ecosystems functioning, ichthyofauna of the littoral and coastal zone, Seasonal distribution of fishes being the objects of industrial and recreational fisheries in the sea coastal zone, birds near the sea coast, marine mammals near the shore.

2.2. Natural and historical-cultural heritage

Rare and specially protected species of marine plants, marine invertebrates fish species in the coastal waters, bird species, marine mammals, natural complexes requiring special protection, objects of historical-cultural heritage, analysis of the recreational potential of the territory, proposals on arrangement of sports and recreational fisheries, probable location of stations for observation of sea birds and mammals are presented in this section.

2.3. Assessment of ecological-economical situation

Overview on economical exploitation of the coastal areas, recreational disposal of the Curonian Spit, including near-shore territories, basic elements of the modern infrastructure and development prospects, anthropogenic impact upon the coastal water ecosystem was done in this section.

3. Proposals on delimitation of the protected zone of the Curonian Spit National Park from the side of the Baltic Sea

This chapter includes following sections: Substantiation of expediency of proposed aquatic areas inclusion into the boundaries of the protected zone, Description of the proposed protection zone boundaries, Functional-regime structure of the aquatic areas proposed for inclusion into the protected zone, Arrangement of protection and using of the aquatic areas of the protected zone.

To preserve the integrity of the natural complexes of the Curonian Spit as a unified landscape formation, the protected zone of the National Park will be created in the 12-mile zone of the internal sea waters and territorial sea of the Russian Federation adjacent to the western coast of the Curonian Spit with the boundaries along the 20-m isobath (about 2.5-4 km from the coast-line).

This part of the sea slope is an integral part (socle) of the exposed part of the Spit and directly affects its stability. The analysis of the most valuable objects distribution confirms the expediency of passing the boundary along the 20-m isobath. The marine boundary of the Curonian Spit National Park in Lithuania is also located along this isobath, though the distance from the shore does not exceed 2.5 km there.

At last, it is necessary to acknowledge that the aquatic boundaries of the protected zone are reasonable to be fixed along the 20-m isobath, since it is marked in the most maps of the coastal areas of the South-East Baltic Sea. At the same time, in view of complex configuration and variability of the isobath line in this area, the boundaries must be drawn along the strait lines connecting turning reference points.

Therefore, the boundary of the protected zone of the National Park is proposed to set in the sea parallel to the 20-m isobath at the distance 2.5-4 km from the shore-line and to extend it further at the same distance from the shore in the moraine island area near s.Rybachiy, where it protrudes too far into the sea.

The total area of the protected zone of the National Park within the above indicated boundaries constitutes 15,517 ha.

4. Social-economical consequences of creation of the protected zone in the National Park

4.1. Losses related to ceasing the natural resources extraction

In this section was done estimation of losses related to ceasing commercial fisheries, to prohibition of the mineral resources, for the agricultural sector, for the hunting sector, restriction of recreational use of the aquatic areas.

4.2. Financial expenditures related to creation of the protected zone of the Curonian Spit National Park

The expenditures related to creation of the protected zone of the National Park during the initial period (1-3 years) will amount to about 7464.8 thous. rubles.

Conclusions

Creation of the protected zone of the National Park will contribute considerably to preservation of biological diversity in the South-East Baltic Sea.

To preserve the integrity of the natural complexes of the Curonian Spit as a unified landscape formation, the protected zone of the National Park is proposed to be created in the 12-mile zone of the internal sea waters and territorial sea of the Russian Federation adjacent to the western coast of the Curonian Spit with the boundaries along the 20-m isobath (about 2.5-4 km from the coast-line). At the same time, in view of the complex configuration and variability of the isobath in this area, the boundaries will be fixed along the straight lines connecting the turning reference points.

The total area of the protected zone is about 15.5 thous. ha.

Appendix 1. Annotated list of ichthyofauna in the littoral and near-shore zones of the sea areas of the Curonian Spit

Appendix 2. Draft Regulations on the protected zone of the Curonian Spit National Park from the side of the Baltic Sea

Appendix 3. Territory of the protected zone of the Curonian Spit National Park. Territory of the protected zone

Appendix 4. Territory of the protected zone of the Curonian Spit National Park. Valuable natural objects

Introduction

Preservation of the Curonian Spit and adjacent water areas can be realized only by the joint efforts of Russia and Lithuania. On 19-20 June 2013 the workshop was held at the Visit-Center of the Curonian Spit National Park to discuss the practical steps promoting development of the joint management plans by Russia and Lithuania. This meeting was one of the measures of HELCOM-EU international project "Implementation of the Baltic Sea Action Plan" (BASE).

As a result the participants supported the proposed establishment of the protected zone of the National Park and discussed the basic principles of its creation. The participants of the discussion agreed that the width of the protected zone could not and should not be set at the fixed distance from the shore, basing on the principle "as in the Lithuanian part". Such unification will reduce the importance of this nature protection measure, as far as the main purpose of the protection zone creation is ensuring preservation of the National Park and its valuables, primarily the landscape object of the Curonian Spit and its basement submerged into the sea at various distances from the shore.

The purpose of this study is to substantiate granting the legal status of the protection zone to the sea areas adjacent to the boundaries of the Curonian Spit National Park aimed at preservation of the ecological integrity of the National Park natural complexes and maintenance of biological diversity in the southern Baltic Sea.

The immediate task is to prepare the Materials of the complex environmental examination of the Baltic Sea areas substantiating granting these areas the legal status of the protected zone of the Curonian Spit National Park.

The results obtained were presented at the meeting attended by the concerned parties and held on 29 May 2014 in the Curonian Spit National Park. Many comments and proposals have been advanced, most of which will be considered in the process of improvement of the draft Regulations on the National Park Protection Zone and the explanatory note to it. These documents will be sent to the Ministry of Natural Resources and Ecology of the Russian Federation for approval.

Following specialists took part in preparation of the report:
July Dobrushin, Armen Grigoryan, Stanislav Babich, Sergey Kondratenko, Liudmila Poplavskaia, Yulia Shidlovskaya, Irina Zhukovskaya, Oleg Rylkow, Elena Ezova, Alexey Guzsin, Gennady Grishanov.

1. BRIEF CHARACTERISTICS OF THE CURONIAN SPIT NATIONAL PARK

1.1. Characteristics of the natural conditions

1.1.1. Geographical location

The Curonian Spit is a long (98 km) and narrow (0.35 – 3.8 km) sand peninsular of 16 thous. ha in area at the south-eastern coast of the Baltic Sea, stretching in the shape of a slightly concave arch from the south-west to the north-east from Zelenogradsk (Russia) to Klaipeda (Lithuania) and separating the Curonian Lagoon from the Baltic Sea. The Curonian Spit is the largest accumulative sandy formation with linear dunes of the swell-shape type. in the Baltic region.

The National Park was created under the Decree of the Council of Ministers of the Russian Socialist Federal Soviet Republic No. 423 dated 06.11.1987 ”On creation of the Curonian Spit National Park in the Kaliningrad Region”. The area of the National Park amounted to 6621 ha, including 351 ha of land owned by external owners and users and included into the boundaries of the National Park without withdraw from the economical exploitation.

The protection zone of the National Park has not been approved yet.

The territory of the Curonian Spit is officially under the protection of the UNESCO Convention on Conservation of the World Cultural and Natural Heritage of 16.11.1972 ratified by Russia in1988.

1.1.2. Physical and geographical conditions

The climate of the Curonian Spit is the intermediate between marine and continental and is characterized with frequent and intense variability of the weather, mild winter and temperately warm summer. In winter the cloudy weather with frequent precipitation prevails. Strong frosts are rare and usually of short duration. Spring is cool, while in summer the hot weather occurs very seldom and for short periods. Autumn is warm, rainy and windy.

The hydrological network of the peninsular consists of temporary streams and small lakes. The largest lake Chayka (Sea-gull) near s. Rybachiy is 0.22 km^2 in area. In the prewar period the colony of sea-gulls exceeding 800 pairs in abundance lived at the lake.

1.1.3. Structure of the Curonian Spit and the history of its formation

From the standpoint of geology the Curonian Spit peninsula represents an outstanding object of the latest stage of the Earth evolution with high dynamics of geomorphological processes. Both the Spit and adjacent sea areas had appeared the place of conjugation and cropping out of various geological formations for several thousand years.

Origination and formation of the Curonian Spit is closely related to the history of the Baltic Sea development, since the Spit is the integral part of the latter.

After regression of the latest (Valdai) glacier, the undulating moraine plain crossed with the hill ridge had been formed in the area of the current Curonian Spit and Curonian Lagoon. During the post-glacial period the Baltic depression was gradually filled with the waters of the Baltic Ice Lake, saline Yoldia Sea and warm Ancylus Lake.

Geological structure of the Curonian Spit is determined by its location within the Baltic syneclise representing the western edge of the ancient East-European platform. This structure (caving - depression) accumulated a thick (2.0-2.5 thous.m) layer of deposits of various age and composition during the long period of its existence.

The upper 300-m portion of the layer consists of Cretaceous and Quaternary rocks. The layer basement is formed by the bedrock of chalk-clay, sands, sandstones, silica clay with glauconite, tripolite. The layer thickness is about 100 m.

The Cretaceous deposits are covered with the Quaternary layer forming the structural socle of the Curonian Spit. It is represented by the glacial (moranic boulder loams) and aqueoglacial (sands with gravel and pebbles) deposits of the total thickness from 80 to 100 m.

The upper, most young post-glacial part of the sedimentary cover consists of alternating soils of different composition and origin, such as lake (sands, clay, sapropel), alluvial (sands, sandy loams, silts), lagoon (marls, sapropels, aleurites, silts), marsh (peat), marine (sands) and eolithic (sands) soils.

1.1.4. Natural territorial complexes

In the coastal and near-root parts of the Spit the main area is occupied by the *low palve area* with the surface exceeding considerably the sea level. Regular flooding of the territory resulted from the sea water filtration and rise of the ground water level is a typical event there.

In the near-lagoon part of the Spit, as well as in some points of the sea-shore line, the areas of eolithic hillocks and inter-hillocks depressions of the *high palve area* prevail. This area is characterized with well-drained sandy habitats, the contrasts of which are related to the different depths of the ground water location. The wast areas of park pineries with meadow-green moss vegetation on the turf-slightly-podzol soils with relatively low species diversity are most typical for the high palve and the Spit as a whole. They occupy the surfaces and slopes of eolithic hillocks and relatively smooth areas.

In the near-lagoon zone the area of large dune ridges, stretching along the peninsular for almost 50 km, prevails. Linear dunes up to 60m in height above the sea-level and from 0.3 to 1.0 km in width predominate. The wast areas of active sandy dunes with a complex low-hilly relief and numerous steep-slope residual-mountains prevail. As a rule, the western slopes of dunes directed to the sea are less steep as compared to the eastern slopes, which sometimes drop abruptly into the Curonian Lagoon. Unfixed dunes are affected by permanent deflation processes and are moving to the east with a velocity up to 4 m per year. This movement of dunes during a long period has led to formation of accumulative protrusions extending far into the lagoon and to the shallowing of the western coast of the Curonian Lagoon.

In the narrow near-sea zone the peculiar area of *artificial foredune* had been gradually formed during two centuries. Its formation provides protection of the internal part of the Spit from intrusions of the sea water, winds and sands.

A special area, including a large number of rare locations of the Curonian Spit, is represented by the *area of moraine island* near s. Rybachiy. In the place of removed oak-droves the mesophytic and sometimes mesohydrophytic meadow appeared, which is unique for the Spit. Its sustainable existence has been maintained by pasture and hay-mowing. In the case of ceasing these temperate agricultural activities, the meadow will be overgrown with trees very soon. The unique mesophytic meadow concentrates habitats of rare plants and becomes a good example of careful nature treatment.

1.1.5. Flora and vegetation

According to the phytogeographical classification, the territory of the Curonian Spit is referred to the zone of mixed coniferous-broad-leaved forest.

In spite of the relatively small area, the territory of the Curonian Spit National Park is characterized with considerable flora species diversity. Above 50% of plant species of the Kaliningrad region appear within the Spit territory. According to the latest data, 884 species and forms of higher vascular plants, 45

species of moss, 348 species of lichen have been found there. Trees and bushes species are exceptionally diversified (169 species, including 91 introduced species).

In general, 109 protected species have been recorded, which are included into the Red Books of the Russian Federation, Kaliningrad region and the whole Baltic area.

1.1.6. Fauna

Fauna of the Curonian Spit is notable for several peculiarities making it unique. These peculiarities include extremely high species diversity and "life richness" within a relatively small area; concentration of enormous number of birds as a result of the migration route passing along the Spit and connecting Scandinavia, Baltic region and North-West of Russia to the South Europe and Africa; and at last, very active succession processes in young ecosystems of the Spit leading to impetuous changes in the faunal complex. The above mentioned characteristics provide the inestimable material for scientific research and biomonitoring.

The aquatic invertebrates species include many relics from arctic and sub-arctic fauna preserved since the early Holocene.

The vertebrate animals fauna consists of 338 species, including 28 species under the threat of extinction in Russia and in the World, which have been entered into the Red Books of the Russian Federation, Kaliningrad region and the International Council of Nature Protection (MCOP).

Ichthyofauna of the Curonian Lagoon includes 42 species of fish and Cyclostomata. Bream, smelt, pike-perch, eel, whitefish prevail in catches. The coastal waters of the Curonian Spit became a shelter to rare and endangered species such as eelpout, salmon, sea trout, shad, alosa (allis shad), vimba, etc.

The mammal fauna of the Curonian Spit includes 46 species. The long-term nature protection regime, mosaic pattern of habitats and general restriction of the territory are favorable to the high abundance of the most animal species and create exceptional conditions for scientific observations. The most common species include elk, European deer, wild boar, fox, marten, ermine, badger, hare, squirrel, beaver. Regular appearance of trot is observed. The most rare and protected species include river otter, gray seal and harvest mouse.

1.1.7. Current state of ecosystems

Landscapes of the Curonian Spit were formed as a result of complex and durable interaction of the nature and people, therefore both natural and anthropogenic factors, negatively affecting the dune

ecosystems, are observed in the area. These factors include increase of the cyclonic activity with strengthening stormy activities and rate of shores washing-out; deficiency of sand reserve on the submerged shore slope of the Curonian Spit; reduction of dunes height owing to sand weathering and transportation into the Curonian Lagoon; rising of the ground water level and flooding of low areas of the Spit; uneven anthropogenic impact upon dune landscapes; absence of developed infrastructure in the settlements on the Spit..

Deterioration of the ecological situation related to water pollution in the sea and the Curonian Lagoon affects negatively the coastal zone of the Spit. Intensification of fishery, aquatic transport, extraction of building materials, input of contaminants with river discharge have increased the level of pollution of the water and, consequently, of the beach zone from year to year.

A certain regularity of oil products occurrence on the sea coast of the Kaliningrad region has been revealed: during westerlies oil products appeared from the side of the Gulf of Gdansk, where the oil terminal and tanker station are located, while during northerlies oil products are transported from the side of Lithuania, where oil terminal of Buting and tanker operation base of Klaipeda are located.

The long-term natural process of pollution, facilitated by the human activities, has been gradually changing the Lagoon ecosystem, leading to extinction of some species and appearance of others, which are more adaptable to the varying conditions.

More than 70% of the Curonian Spit territory is covered with forests. In addition to the problem of low resistance of forests to harmful insects (pine silkworm, European pine sawfly and pine sawfly, bark beetle, etc.), the ecological situation in forests of the Spit is complicated by fires, especially during dry summer periods, which, as a rule, coincide with active visiting of the National Park by resting people.

The main reason of fires is non-observance of fire-prevention measures. Young pine forests growing on dunes, especially mountain pines, are the most dangerous objects. The stuff of the National Park is working actively to prevent fires.

One of most important functions of the Curonian Spit National Park is to provide conditions for people recreation and health improvement. However, the increasing number of resting people from year to year leads to the negative consequences for the nature, including trampling down the grass, compression of the soil, damaging trees and bushes, increase of the wind erosion of dunes, accumulation of rubbish, appearance of numerous paths in the forest and foredune within recreation and tourist zones. As a result of increasing number of cars entering the National Park, the frequency of

speed limits exceeding has also increased, which often resulted in death of animals on the roads, including foxes, hedgehogs, dears, elks, wild boars.

The National Park plays a very important role in conservation and recovery of the natural complexes of the Spit intended for regulated tourism and recreation. The stuff of the National Park fulfill systematical works to reinforce the coastal protection dune, to plant new and recover old vegetation, to undertake measures for forest protection against pests, to improve the esthetic quality of landscapes, to control and support animals abundance. Much attention is paid to formation of recreational infrastructure, including parking zones, rest places, footpaths, observation sites, etc.

In spite of considerable efforts undertaken by the National Park stuff to preserve the natural complexes of then Curonian Spit, the problems related to pollution of the coastal zone and the waters of the Baltic Sea and Curonian Lagoon, decrease of biological diversity, deterioration of landscapes, regulation of recreational activities are still very urgent. In this situation, the complex system of monitoring the state and trends of the Curonian Spit ecosystem development is one of the most important conditions required for planning economical activities and measures aimed at maintenance of the natural balance in the territory.

1.2. ACTIVITIES OF THE NATIONAL PARK

1.2.1. Organization of the territory and regime

The territory of The Curonian Spit National Park was determined by the Decree of the Council of Ministers No. 423 of 06.11.1987. Almost all boundaries of the National Park are natural and are passing along the coast-line of the Baltic Sea and Curonian Lagoon. In the north the boundary coincides with the state border of the Russian Federation and the Republic of Lithuania. In the south-west (the root of the Spit) the National Park has the common boundary with lands of the town of Zelenogradsk. In the south-east the National Park includes a cluster area (squares 81 and 82 of Zelenogradsk forestry), which has neither natural nor historical relationships to the Curonian Spit and is united with the Spit by the Curonian Lagoon.

In 1992 the additional lands in the Spit root with the total area of 352 ha were included into the National Park territory owing to forest management works, though this area inclusion has not been approved by the Decree of the Government of the Russian Federation yet. However, it should be noted that this area is located within the geographical boundaries of the unique natural object – the Curonian Spit and the

expediency of its inclusion into the National Park system is evident. At present, the protection zone of the National Park is absent.

The National Park is divided territorially and administratively into 2 district forestries – “Zelenogradsk” in the southern part of the Spit and “Golden Dunes” in the northern part. The administration center of the Park is located in s.Rybachiy. Besides, the National Park has the Visit-Center in Kaliningrad playing an important role in ecological-educational activities and interrelations with touristic organizations of the region. Two control posts (at the entrance from Zelenogradsk and at the Lithuanian border), the museum complex of the Park and the network of permanent ecological routs (footpaths) constitute very important elements in the territorial management system.

The currently acting *functional-regime structure* of the territory is determined by the Regulations on the Curonian Spit National Park adopted by the Order of the Ministry of Nature of the Russian Federation No.380 of 09.11.2012 and registered at the Ministry of Justice on 21 December 2012 under the number 26255.

In National Park territory the differential regime of special protection has been established taking into account natural, historical and cultural, economical and other peculiarities. Five functional zones are defined within the National Park (Fig.1).

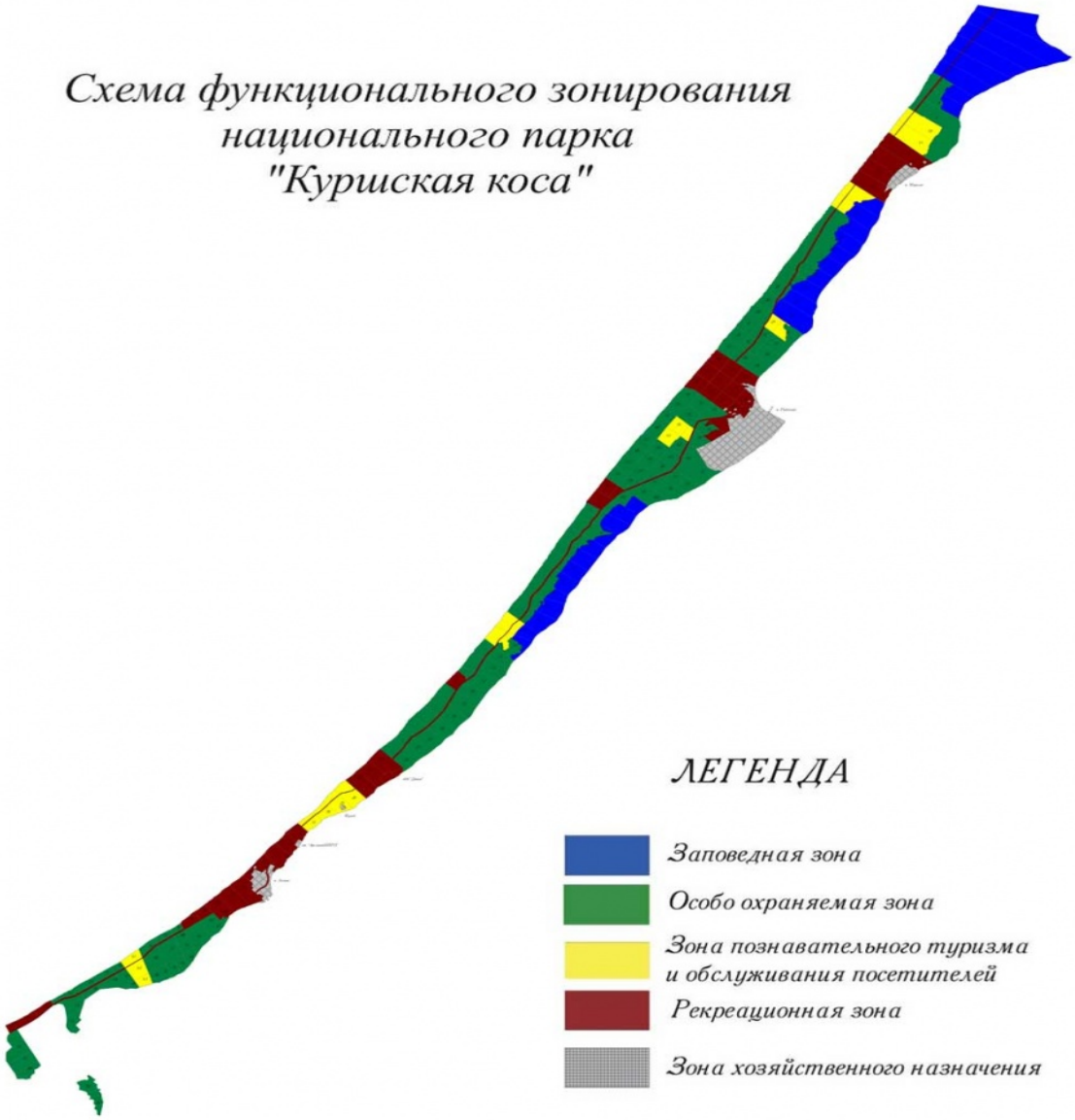


Fig. 1. Scheme of functional zones of the Curonian Spit National Park.

Reserved zone has been created to preserve and research natural complexes and objects in natural processes and events. The reserved area is 1413 ha or 21.3 % of the National Park territory.

Specially protected zone provides conditions for preservation and recovery of valuable natural complexes and objects and visiting this zone is strictly regulated. The area of this zone constitutes 2809 ha or 42.4 % of the National Park territory.

Recreational zone is intended for arrangement of recreational activities in the natural environment. This zone development is directed to reception of visitors and tourists. The area of this zone is 2048 ha or 31 % of the National Park territory.

The recreational zone includes also zones of 50 m in width along both sides of the main road Kaliningrad – Morskoye – Klaipeda.

Zone of economic purpose includes the territory of settlements Lesnoye, Rybachiy, Morskoye and the land included into the National Park territory without withdrawal from the economic exploitation. It is managed in compliance with "Regulations on the regime of lands included into the Curonian Spit National Park without withdrawal from the economic exploitation". The area of the zone of economic purpose constitutes 351 ha or 5.3 % of the National Park territory.

1.2.2. Inspection service

In the territory of The Curonian Spit National Park the divisional form of the territory inspection has been traditionally organized. The state inspectors of the Department of Forests Recovery and Preservation are patrolling the areas assigned to them according to the adopted routs of patrolling - 6 areas for forestry "Golden Dunes" and 6 areas for forestry "Zelenogradsk".

The Department of Forest Recovery and Preservation includes 2 mobile patrol groups consisting of 2-3 persons each, as well as inspectors of the control post (6 inspectors). The total number of the Department staff is 15 inspectors.

The operational group is a continuously acting structural subdivision of the National Park created to strengthen protection of the natural complexes and objects by the Director's Order of 01 July 2007. This group consists of 4 inspectors (2 mobile groups).

1.2.3. Research, educational and recreational activities

Research activities in the National Park are carried out by the stuff of *Scientific Department* (5 persons). The research and scientific activities of the National Park is aimed at development and implementation of scientific methods of preservation of biological diversity, natural and historical-cultural complexes and objects in conditions of recreational disposal of the territory.

The system of priorities, elaborated taking into account the natural and historical-cultural specifics, goals and real needs of the National Park has been assumed as a basis of scientific research fulfillment. The priorities have been defined for each component of scientific research works – inventory, monitoring and problematic research.

To improve the scientific activities arrangement and regulation, the Scientific and Technical Council has been created in compliance with the "Regulations on the Federal State Institution the Curonian Spit National Park". The tasks of the Scientific and Technical Council include elaboration and substantiation of proposals on implementation of measures in the field of research, reproduction, exploitation and protection of natural resources and environment, ensuring the ecological safety, formation of the uniform scientific-technical investment policy in the field of reproduction of aquatic and forest resources, protection of the natural environment, preservation of biological diversity in the territory of the Curonian Spit National Park.

Ecological-educational activities of the National Park are aimed at supporting preservation of the biological and landscape diversity, historical and cultural heritage by various strata of society, being the necessary condition of fulfillment of the tasks allocated to the National Park. These activities also contribute to solution of the regional ecological issues, provide formation of the ecological consciousness of the population and promote development of the ecological culture.

From 2004 the ecological-educational activities have been carried out by the Department of ecological education, tourism and recreation. This Department also manages the Visit-Center and the Museum Complex of the National Park, including the Museum of Nature and Museum of Woods, and Information Center of the National Park, situated in Kaliningrad and is responsible for interactions with the regional touristic organizations. The Department staff consists of 5 persons

1.2.4. Financial and material-technical basis of FGBU Curonian Spit National Park

The current financing of the National Park is formed from various sources, though the federal budget is the major one. During the latest 5 years (2008 – 2013) the federal budget share in the total budget of the National Park amounted to about 30%, while in the previous years it did not exceed 20%. In the latest 3 years the annual budget amounted to 35 - 37 mln. rubles. About 70% of this sum constitute revenues from paid services, including mostly (95% or about 25 mln. rubles per year) the fee for recreational services in the National Park territory paid at 2 control posts. Due to the specific geographical position of the Spit, visitors are able to enter the National Park only through these 2 control posts. The regime of paid visiting the National Park has been established since the date of its creation and is acting until now. During 2012 more than 230 thous. tourists visited the National Park.

The expenses of the National Park include wages to the stuff and relevant taxes in amount about 23.8 mln. rubles or 67% of the total annual expenditures. At the same time, almost 70% of wages is paid from non-budgetary funds. The expenses for transport services amount to 439.3 thous. rubles or 1.2%. The

expenses for public utilities constitute about 1 mln. rubles. Services related to property maintenance, including repair, constitute 1.5-2.0 mln. rubles or 5-6%. The expenses for purchasing fixed assets amount up to 2 mln. rubles per year. Purchasing materials constitutes about 10% of the budget or above 3.5 mln. rubles annually.

Material and technical support of the main activities. The initial cost of the capital assets of the National Park as at 01.01.2013 constituted 48372.7 thous. rubles. The depreciated cost amounts to 20185.8 thous. rubles. The average depreciation constitutes 47.3% being rather good for parks in general.

1.2.5. Role and functioning of the Curonian Spit National Park in the terms of ecology and economics within the region and the Russian Federation

Regarding ecology, the National Park fulfills the following basic tasks:

- preservation of the natural complexes, unique and standard natural areas and objects, flora and fauna;
- preservation of historical and cultural objects;
- ecological and historical-cultural education of people;

The National Park contributes considerably to the social-economic development of the region. The amount of revenues to the budgets in the form of taxes constituted 31.5 mln. rubles for the latest 3 years. The Park spends more than 15 mln. rubles to pay production, goods and services of external organizations annually.

The availability of the National Park in the territory of the Kaliningrad region significantly improves opportunities of tourism development and, therefore, facilitates investments into the region and promotes development of related industries, transport, trade, handicrafts. Taking into account only revenues from services provided to tourists from foreign countries and other regions of Russia visiting the Curonian Spit, the funds entering the Kaliningrad region from outside constitute at least from 200 to 400 mln. rubles annually.

1.2.6. Characteristics of the object of the UNESCO World Heritage

The value and importance of the Curonian Spit has been recognized by the world community and in 2000 the entire territory of the Curonian Spit was entered into the list of objects of the UNESCO World Heritage in the category “the cultural landscape”, i.e. the landscape transformed by human activities.

2. CHARACTERISTICS OF THE TERRITORIES (WATER AREAS) PROPOSED FOR INCLUSION INTO THE PROTECTED ZONE

2.1. Characteristics of the natural complexes, components and objects

2.1.1. Relief and geological structure

Relief and geomorphological processes. The coastal zone of the sea is affected by various natural and technogenic factors and processes.

The coastal relief of the Curonian Spit is represented by the sea beach zone and protective dune swell (foredune).

The beach is formed along the entire Spit as a result of accumulation of sediments brought by the sea. The beach zone width varies from 15 to 50 m and its structure includes quartz sands, sometimes with significant admixture of dark heavy minerals (ilmenite, magnetite), as well as garnet, zircon and others. In some beach areas considerable concentrations of pebbles and boulders are observed.

The foredune stretches parallel to the beach. It was created by people on the place of natural individual sea-shore dunes in the 19th century.

Geological structure. The sedimentary cover under the Curonian Spit is from 2000 to 2500 m in thickness. In the most deep part of the Baltic syneclise the cover thickness is twice more. The cover has almost horizontal structure.

Mineral resources. In the territory of the Curonian Spit National Park sand deposits are situated. The oil-fields are situated on the shelf of the Baltic Sea.

2.1.2. Climatic features and ice-hydrological conditions

The marine climate prevails in the coastal area of the Curonian Spit. Winter is mild with dominating cloudy weather and frequent precipitations. Severe frosts occur very rare and during short periods. Spring is cool and summer is not hot. The hot weather is very seldom and usually of short duration. Autumn is warm, wet and windy.

2.1.3. General characteristics of marine bottom communities in the coastal waters of the Curonian Spit and their role in ecosystems functioning

From the moment of the Kaliningrad region establishment any research of various communities in the coastal areas of the Curonian Spit for the purpose of inventory of marine species diversity and subsequent development of nature protection measures for marine invertebrates, bottom algae and communities formed by them, has been never carried out. In this connection, the assessment of species diversity, occurrence and distribution of rare, vulnerable, extincting and other species covered with ecological regulations of various levels, should be based on available data from publications and scientific funds. The present conclusions have been prepared on the basis of the fund material of AO IORAN taking into account all publications relevant to the sea area along the Curonian Spit coast.

Any published data on the species composition and distribution of macrophytic algae in the water areas along the Russian part of the Curonian Spit are actually absent. Since 1970s no special underwater surveys of macrophytobenthos with quantitative and qualitative sampling had been fulfilled. One local diving survey was carried out by AO IORAN in 2001 and one general remote underwater video survey was fulfilled at 2 hydrological sections in 2013 providing information on availability or absence of algae communities.

Macrophytobenthos communities (macrophytic algae). Currently 32 species of macro algae have been found in the Russian part of the South-East Baltic Sea. These species constitute 64% of the potential flora of macro algae in the area, including 10 species of Rhodophyta (Red), 10 species of Phaeophyta (Brown) and 12 species of Chlorophyta (Green). These data are comparable to the species number in adjacent areas. For example, in the territorial waters of Poland and Lithuania 36 species of macrophytic algae were found after 1970.

Distribution of benthos macrophytic algae along the coast is irregular and, to the great extent, depends on granulometric composition of bottom sediments. For development of macrophytic algae hard substratum is favorable (bedrock outcrops, boulders, pebbles, gravel), where macrophytic algae are able to attain high density and biomass. Algae are also observed on coarse-mixed-type sands with gravel and pebbles, however, in such areas they are concentrated only on rocks and do not attain high abundance. In some cases macrophytic algae grow on the dense clay soil.

The compact boulder-block structure in the Russian part of the South-East Baltic Sea was recorded in the shallow zone, mainly near the western edge of the Sambia Peninsula. In this area the rock bottom covered with algae is stretching from the water edge to the distance of 1-3 km from the shore. Distribution of macrophytic algae to the depths is restricted with 12-m isobath due to the light

conditions (the photic zone). The maximum species richness (11-12 species) was found in the area near the settlement Filino – cape Taran.

Another type of substratum suitable for macro algae development is represented by the areas of coarse detrital deposits and sands with gravel and pebbles situated along the northern coast of the Sambia Peninsula, against the root part of the Curonian Spit and against the central part of the Russian territory of the Spit. However, the main area of these substrata distribution is outside the photic zone, since it begins not from the water edge, but at the depth below 10-m isobath. In the areas of these substrata distribution near the northern coast of the Sambia Peninsula at the depths up to 12 m scarce and poor communities of macrophytic algae may be found.

Besides, along the entire coast-line, where sands are the most common type of bottom sediments, algae-foulers are usually observed on stones, dike dams, piles and other natural or artificial substrata.

The vertical zonality is well pronounced in algae distribution. From the water edge to 2-3 m offshore the euryhaline, ecologically flexible species of green annual algae prevail.

From the depth 1.5 m the above mentioned dominating annual green filamentous algae are supplemented with the brown filamentous algae *Polysiphonia fucoides* and species of gen.Ceramium. From the depth 2.5 m, where large boulders are available, *P. fucoides* and species of Cladophora, including perennial *C.rupestris,* dominate together with perennial red algae *Furcellaria lumbricalis*. At the depths from 3.5 to 6 m (sometimes up to 7-9 m) *F. Lumbricalis* dominates in the algae community. At present, the most deep-water zone of macrophytes distribution is observed at the depths from 8 to 12 m and is represented almost exclusively by the perennial red algae *Coccotylus truncatus*. Below these depths macrophytes have not been observed.

The available information concerning macrophytic algae distribution along the Curonian Spit coast within 3-km band is presented below.

In the water edge zone within the depths range from 0 to 2 m, like along the entire sea coast of the Kaliningrad region, the pronounced upper band of overgrowing is represented mostly by green filamentous algae with non-abundant brown filamentous algae and one species of cortical red algae This band is not continuous, since sands are distributed along the entire coast in the shallow water areas and this substratum is unfavorable for the most macrophytic algae development. Plants may grow along the whole coastline of the Spit, but only in the places, where artificial (dike dams, piles) or natural (individual stones) hard substratum is available.

In the areas of coarse detrital rocks and sands with gravel and pebbles at the depths up to 10 m, inclusive, non of bottom algae were found during the reconnaissance diving survey in 2001. However, a certain probability of macroalgae existence in these areas still remains, especially small and epiphytic algae growing on shells, Balanus and pebbles. The improvement of ecological conditions and water transparency may lead to development of macroalgae communities in the above mentioned areas (Fig.2).

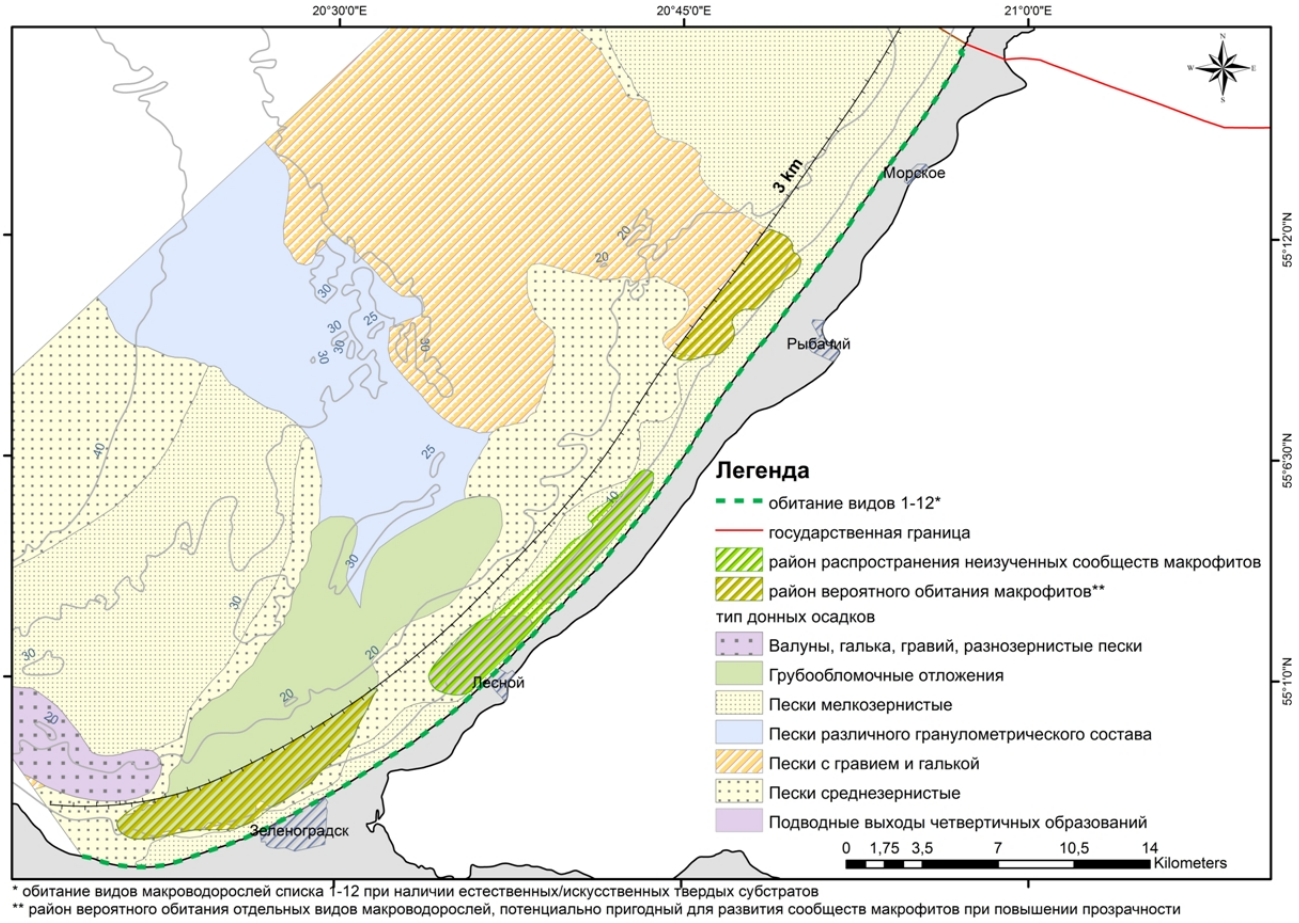


Fig. 2. Distribution of macrophytic algae in the coastal zone of the Curonian Spit and the areas of probable habitats of macrophytic algae based on the data of AO IORAN (2001-2013).

Communities of macrobenthos (invertebrates). The potentially probable number of macrobenthos species in the Southern Baltic Sea approaches to about 400, however, only 52 species constitute the basis of the bottom macrofauna in the area. During the research period from 2001 to 2013, totally 67 species and representatives of 4 groups not identified by species were found in samples from the Russian part of the South-East Baltic Sea. The obtained index of species richness is sufficiently high for the researched area and is probably close to the respective estimate typical for the area in the current period of time.

During the research period, 34 species of bottom invertebrates were recorded in the area along the Curonian Spit from the coastal shallow zone to 50-m isobath.

The taxonomic diversity in samples was low, varying from 1 to 22 species. In samples from poor communities usually 2-4 taxons were observed, while in the most diversified communities, such as communities of mussels, from 13 to 22 species could be found. In general, the species diversity increases with the depth approximately up to the 25-m isobath. Up to the 5-m depth the number of taxons in samples varies from 2 to 12 (6 on average without considering mussel communities). At the depths from 5 to 10 m the number of species in samples varied from 3 to 20 (10 on average). At the depths from 10 to 25 m the similar situation is observed and the number of taxons slightly differed in samples averaging to 12. Below 70 m the communities are very poor and include no more than 2-5 species. Below the 83-m level no macrobenthos organisms have been found. Therefore, the bottom zones from the water edge to the depth of 5 m and below 70 m are the poorest from the taxonomic point of view in the considered area.

In the coastal zone along the central part of the Curonian Spit, where fine sands and coarse aleurites prevail, the lowest species diversity was observed (no more than 5 species per one station).

On the basis of the dominant complex structure in the Russian part of the South-East Baltic Sea up to the 70-m isibath, four main bottom communities have been distinguished, including three communities with predominant (by biomass) bivalve molluscs - *Macoma balthica*, *Mya arenaria* or *Mytilus edulis,* and one community with prevailing polychaetes-spinoids *Marenzelleria neglecta and Pygospio elegans*. These 4 communities have been observed within 3-km coastal zone along the Curonian Spit in the Russian water areas (Fig. 3). Besides, on the basis of the underwater video study fulfilled in 2013, the community of *Corophiidae+Gammaridae+M.edulis*, never described previously in that area, was found near the Curonian Spit.

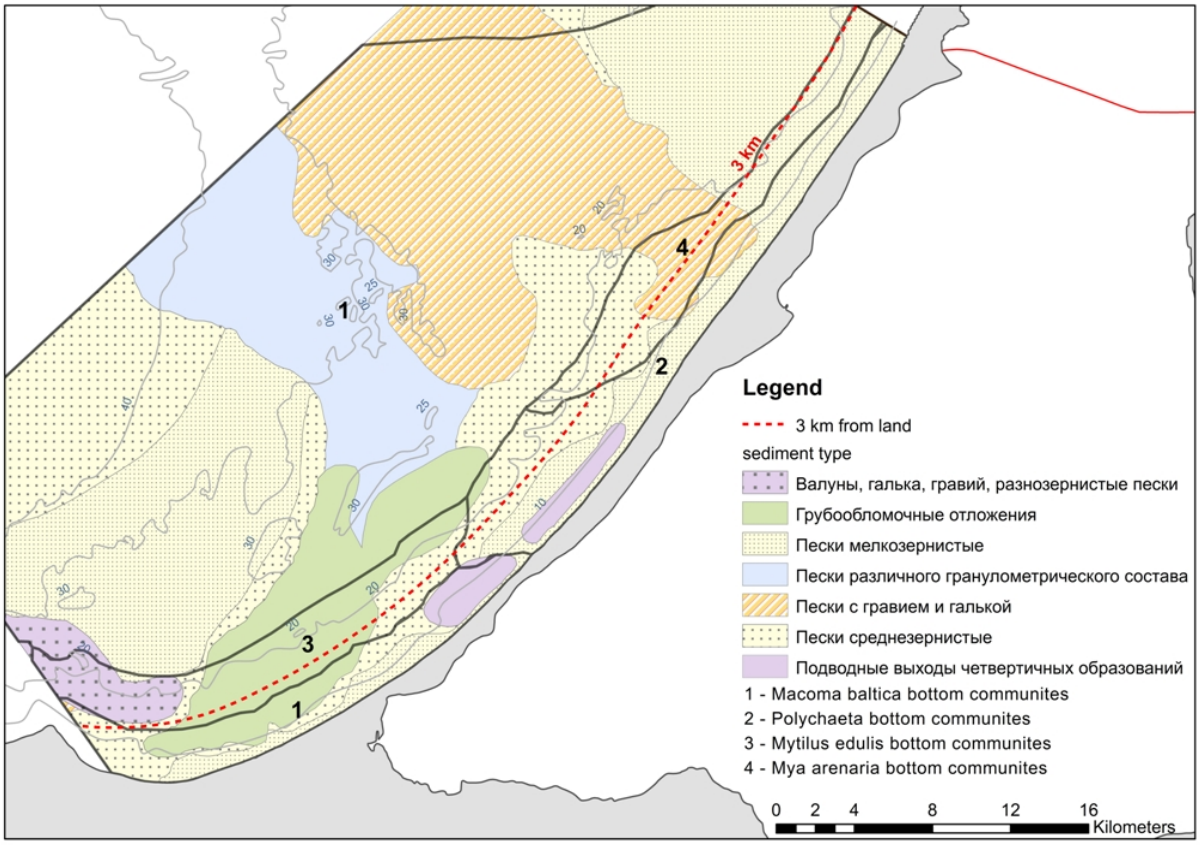


Fig. 3. Community of marine invertebrates distinguished on the basis of the data from AO IORAN

The polytopic **community with dominating *Macoma balthica*** is the most commonly distributed. It is observed in various grounds and belongs to the most deep-water communities. In the shallow areas at the depth up to 10-15 m it appears only on fine sands in the root part of the Spit, while, in general, this community distributes at the depths below 20-25 m on mixed-size sands and sands with gravel and pebbles.

In the hard substrata (boulders, gravel, pebbles) in the areas with coarse detrital rocks the highly productive **community with dominating *Mytilus edulis*** is observed. At present it is clear that the boundaries of *Mytilus edulis* biocenosis in general entirely covers the area of distribution of boulders, gravel and pebbles. The community of *M. edulis* appeared the most productive in the researched area and one of the most productive in the whole Baltic area. Besides, it is the richest community in terms of species within the researched area. During 3 years of research about 30 taxons were recorded, while 11-14 (maximum 22) species were found per one sample.

In the shallow areas from 5 to 15-20 m within the first one-third of the Curonian Spit the outcrops of Quarternary grounds, so called “ancient lagoon silts”, are observed, where the mixed **biocenosis with dominating Amphipoda and mussels** has been found. Macroalgae forms are also typical to this biotop.

In the rest shallow-water zone (up to 10-15 m) along the Curonian Spit to the border with Lithuania **the community with dominating polychaetes-spinoids** has been developed**.** It is characterized with the lowest species diversity and abundance. This community inhabits fine sands and partially penetrates to middle sands.

Below the 10-15-m isobath the community of polychaetes-spinoids is replaced by the **community with dominating large bivalve mollusk *Mya arenaria***. This species prefers biotops with sufficiently active hydrodynamics in the near-bottom layer enriched with organic suspended matter.

2.1.4. Ichthyofauna of the littoral and coastal zone of the Curonian Spit

Ichthyofauna of the near-seashore waters of the Curonian Spit and their role in the ecosystem functioning. The littoral and near-shore water zone of the Russian part of the Curonian Spit and the National Park is stretching along the Spit to the distance of 44 km. The near-shore waters of the Curonian Spit have some peculiar features distinguishing them from other Russian waters of the Baltic Sea. Firstly, almost 90% of littoral area of the Curonian Spit is represented by sandy grounds, which, to a great extent, determine distribution and species composition of bottom fishes. Secondly, in the sub-littoral zone 2-3 sand bars divided by depressions on the bottom are morphologically distinguished at the distance of 10-20; 50-80 and 150-350 m from the water edge. The bottom structure of this type results in the situation, when the water temperature in the littoral zone in summer is higher than in adjacent sea areas. Another peculiarity of this zone is the availability of strong currents flowing along the shore and through the depressions between the bars. The third peculiar feature is the low salinity of the coastal waters during the warm season (April-October) owing to filtration of the water from the Curinian Lagoon and water discharge through the Klaipeda Channel. Due to the above mentioned factors and annual variability of the environment conditions, the fish distribution in the littoral and near-shore zones is characterized with the pronounced seasonal pattern, while ichthyofauna in these areas differs from the same in the adjacent open areas of the Baltic Sea.

Ichthyofauna of the near-shore waters is represented by 35 fish species, including 5 species of commercial value. The commercial fish species include sea fishes, such as cod, sprat, Baltic herring, flounder and turbot. The total share of these species in catches from the Russian part of Subdivision 26 of the Baltic Sea exceeds 96%, while the above species are fished with the trawling fishing gears. Catches obtained with the netting fishing gears (fixed and drifter nets) constitute 3% of the total catch. Other fish species, including Atlantic salmon, sea trout, pike-perch are important from the commercial point of view, but their catches are minor as a result of low abundance and biomass of these fishes. In the summer period bream, perch and roach are fished in small amounts from the coastal zone. During the

period of summer desalination of the near-shore waters these species, inhabiting the Vistula and Curonian Lagoons, migrate for food into the Baltic Sea, where they appear in catches. Closer to the shore, individual specimens of silver bream and crucian are observed in catches. The near-shore ichthyocenosis is rather dynamical and unstable as a result of variable environment conditions depending on immediate synoptic factors.

The main role of the near-shore zone in the ecosystem of the Southern Baltic Sea is determined by the fact, that the coastal zone is the area of prespawning concentration of turbot, spawning ground of sand eel, gobies and the feeding ground of young flounders, cod, herring.

The important role of the coastal zone as fish spawning and feeding grounds has been considered in the acting Fishing Rules for the Western Fishery Basin (approved by the Order of Rosrybolovstvo No. 393 of 10 December 2008, in the version of 18.04.2013), which prohibits fishery for all aquatic bioresources with all types of trawling fishing gear within 6-mile near-shore zone of the Curonian Spit during the whole year. Fishing with fixed nets in the coastal zone is restricted by time. The ban for cod fishery is fixed from 15 June to 20 August, the ban for turbot is set from 1 June to 31 July; the ban for fishing flounder and plaice is introduced from 1 March to 15 May; the ban for salmon catching is fixed from 1 June to 15 September. It is prohibited to set any fishing gears for all aquatic bioresources within the near-shore zone of 2.5 n.miles (4.63 km) in width from the coast-line during the period from 1 June to 31 July. Therefore, the applied Fishing Rules ensure protection of aquatic biological resources during the periods and in the areas being most optimal for fish reproduction and feeding.

2.1.5. Seasonal distribution of fishes being the objects of industrial and recreational fisheries in the sea coastal zone of the Curonian Spit

Commercial species. The total annual catch of fish from Subdivision 26 constituted from 30 to 35 thous. t for the period from 2000 to 2011. According to the Fishing Rules any fishing with pelagic or bottom trawls is prohibited within the proposed protected zone including 3.5-4.0 km from the coast-line of the Curonian Spit. Fishery with nets is totally prohibited in June-July in addition to seasonal restrictions of fishing cod, flounder, salmon taking into account biological peculiarities of each species. These measures are aimed at preservation and rational exploitation of fish species.

Non-commercial fish species and their distribution in the near-shore zone. Non-commercial fish species of the coastal zone may be divided into two ecological groups. The first group consists of pelagic species. The abundance of fish species from this group is not high. This group includes garfish Belone belone; mackerel Scomber scombrus; lumpfish Cyclopterus lumpus; three-spined stickleback *Gasterosteus aculeatus*. The first three species are migrants arriving to our areas from the North Sea,

where they are commercial species. Only three-spined stickleback is the endemic pelagic species in the coastal zone.

The second group consists of more species including bottom fishes. It includes butterfish Pholis gunnellus; European ocean pout Zoarces viviparus; small sand eel Ammodytes tobianus; sand goby Pomatoschistus minutus; common goby Pomatoschistus microps; round goby Neogobius melanostomus , black goby Gobius niger; sea scorpion Myoxocephalus scorpius; four-horn sculpin Myoxocephalus quadricornis; sea snail Liparis liparis; plaice Pleuronectes platessa, dab Limanda limanda. Unlike the first group of fishes, all bottom species are closely related to substratum, where they live. The distribution of these species is determined by the ground type (sand, stones or pebbles). This relationship allows to localize zones of these fishes distribution with sufficient accuracy.

2.1.6. Birds near the sea coast of the Curonian Spit

General characteristics of ornithofauna in the research area

In the Baltic Sea area the highest diversity of ornithofauna is typical during the periods of wintering and migration, when more than 40 species of birds may be found in the area.

In the terms of taxonomy the orders of grebes, gooses and plovers predominate. In the land habitats sandpipers are commonly distributed. In the sea areas loons, gulls and Alcidae family are typical.

Nesting birds. Along the coast-line of the Baltic Sea and beaches of the Curonian Spit the nesting birds fauna is represented by 2 species of sandpipers – little plover and ringed plover. Such extremely poor composition of the nesting ornithofauna is stipulated by the environment conditions in the researched coastal zone, including the absence of sea islands, spits protruding far into the sea, weakly indented shoreline.

Characteristics of ornithofauna during the wintering period (December-February).

In the coastal zone near the Curonian Spit shore 18 bird species have been recorded during the winter period. In January usually 10-12 species of birds are observed, which constitute the main part of ornithocenosis during mid-winter period in this part of the Baltic Sea.

Characteristics of ornithofauna during the period of spring migrations (March-April). The spring migration of marine, waterfowl and land birds in the coastal zone of the Baltic Sea near the Curonian Spit begins from the late February and continues until the early May. The peak of migration activity occurs in the second half of March-April.

Characteristics of ornithofauna during the period of autumn migrations (October-November). The autumn migration of marine, waterfowl and land birds in the coastal zone of the Baltic Sea near the Curonian Spit begins from August, while the main stream of migrants is observed from the late September till the late November. The peak of migration activity occurs in the late October-November.

Assessment of birds mortality and endanger factors. During the period from 2003 to 2013 the low level of birds mortality was recorded in the coastal zone of the Baltic Sea along the Curonian Spit shore.

During the period from December 2004 to December 2013 totally 25 dead birds belonging to11 species were found in the process of the coastal surveys.

2.1.7. Marine mammals near the shore of the Curonian Spit

Marine mammals are very rare near the Curonian Spit shore and do not form any dense aggregations. However, in the recent years the situation has changed and pinnipeds appeared near the Curonian Spit shore more frequently and regularly.

In the territorial waters of the Russian Federation near the shore of the Curonian Spit three species of pinnipeds can be observed, including gray seal (the Baltic subspecies) *Halichoerus grypus grypus*, the Baltic ringed seal *Phoca **hispida botnica*** and common seal (the Baltic population) *Phoca **vitulina.*** All species have a special protection status and are included into the Red Books of different levels.

2.2 Natural and historical-cultural heritage

In 2010 the regional law “On the Red Book of the Kaliningrad region” entered into force and the regional Red Book was prepared, where rare and endangered species of animals and plants, as well as the natural complexes, had been entered.

2.2.1 Rare and specially protected species of marine plants

Potentially 43 species of macrophytic algae may grow in the Russian waters of the Kaliningrad region coast, including 11 species, which have not been found but may grow in this area, since they have been observed near the Lithuanian shore. In 2008-2013 totally 19 species were recorded at the stable basis.. The other 10 species, recorded by N.Kovalchuk (2007), have not been observed in samples since 2008. Eleven identified species are considered rare both for our and the neighboring regions. Two species are near-threatened (NT). For three species it is difficult to define the protection category in view of the data deficiency (DD). One species has been classified as extincting and 2 species – as vulnerable (VU).

The potential biota of macroalgae in the Baltic Sea area along the Russian part of the Curonian Spit included species found during route inspections of the shore (2008-2013). Since the precautionary approach is recommended in planning marine Specially Protected Natural Territories, the list also included species, which are frequently observed in the sublittoral zone along the Lithuanian shore and, in general, in the eastern part of the Gotland basin, since they are able to grow along the Russian coast of the Curonian Spit if appropriate substrata are available.

Therefore, the list of potential macroalgae flora along the shore of the Curonian Spit National Park includes 43 species. Out of these species only 12 have been identified in the above said area, while the rest species are potential and are able to grow there on the following substrata: on the piles of breakwaters, on boulders and stones located between the wooden piles, on boulders and stones appeared scarcely on the sand bottom, as well as on the dense surface of the ancient lagoon silts, on crustacean shells (*Mytilus edulis*), on the surface and inside macroalgae (epiphytic and endophytic algae).

2.2.2 Rare and protected species of marine invertebrates

The Red Book of the Baltic region [HELCOM Red List..., 2013] includes 51 species of invertebrates. In total 19 species have the status of "endangered". In the Russian waters of the South-East Baltic Sea area only 5 species out of this list have been recorded, including *Macoma calcarea, Corophium multisetosum, Lekanesphaera rugicauda, Gammarus inaequicauda, Talitrus saltator.* Two of these species have the status of **vulnerable** (VU) and **near-threatened** (NT) species. The status of three species has not been identified in view of insufficient data, however, the available data give the evidence of unfavorable condition of the Baltic populations, therefore, these species have been included into the category **data deficiency** (DD).

2.2.3 Rare and protected fish species in the coastal waters of the Curonian Spit

Fish species entered into the Red Book of the Russian Federation. Ichthyofauna of the Russian zone of the southern Baltic Sea (Subdivision 26) includes 2 fish species entered into the Red Book of the Russian Federation – the Atlantic sturgeon *Acipenser sturio* L. and sea trout *Salmo trutta*.

Fish species entered into the regional Red Book. The regional Red Book includes one marine fish species – sea lamprey *Petromyzon marinus* L.

Fish species not entered into the Red Books but requiring special protection measures. White fish *Coregonus lavaretus and Vimba vimba vimba* are referred to these species.

HELCOM Red List of Fish and Lamprey Species

№	Species name	Threat category	Threat criteria
1	Acipenser oxyrinchus	RE	-
2	Thymallus thymallus	CR	A2bcd
3	Anguilla anguilla	CR	A3bde+4bde
4	Petromyzon marinus	VU	C2a(i)
5	Salmo salar	VU	A4b
6	Salmo trutta	VU	A4b
7	Gadus morhua	VU	A2b,c + A4b,c
8	Scophthalmus maximus	NT	A2bd
9	Zoarces viviparus	NT	A2b
10	Aspius aspius	NT	A3d
11	Cyclopterus lumpus	NT	A2b
12	Lampetra fluviatilis	NT	A2bd
13	Lota lota	NT	A2b
14	Syngnathus typhle	LC	-
15	Triglopsis quadricornis	LC	-
16	Alburnus alburnus	LC	-
17	Alosa fallax	LC	
18	Ammodytes marinus	LC	-
19	Ammodytes tobianus	LC	-
20	Clupea harengus	LC	-
21	Coregonus albula	LC	-
22	Cottus gobio	LC	-
23	Liparis liparis	LC	-
24	Myoxocephalus scorpius	LC	-
25	Pelecus cultratus	LC	-
26	Phoxinus phoxinus	LC	-
27	Thunnus thynnus	NA	-
28	Cottus poecilopus	NA	-
29	Gobio gobio	NA	-
30	Scomber scombrus	NA	-

2.2.4 Rare and specially protected bird species

The assessment of the state of rare and specially protected bird species entered into the Red Book of the Russian Federation and the regional Red Book of the Kaliningrad region observed within the Baltic Sea areas near the Curonian Spit coast is presented in Table 5.

HELCOM Red List of Birds

№	Species name	Threat category	Threat criteria
1	Gavia arctica (wintering population)	CR	A2b
2	Gavia stellata (wintering population)	CR	A2b
3	Clangula hyemalis (wintering population)	EN	A2b
4	Podiceps grisegena (wintering population)	EN	A2b, C1
5	Melanitta fusca (wintering)	VU/EN	A2b/A2b
6	Mergus serrator (wintering population)	VU	A2b
7	Charadrius hiaticula hiaticula	NT	A2bc
8	Philomachus pugnax	VU	A2abcd
9	Limosa limosa	NT	A2ac
10	Tringa totanus	NT	A2ac

11	Actitis hypoleucos	NT	A2ab
12	Aythya fuligula	NT	A2ab
13	Sternula albifrons	LC	-
14	Sterna sandvicensis	LC	-
15	Tadorna tadorna	LC	-

2.2.5 Rare and specially protected species of marine mammals

Three species of pinnipeds can be found in the territorial waters of the Russian Federation near the Curonian Spit shore. All three species have the special protection status and are entered into the Red Books of different levels.

HELCOM Red List of Marine mammals

№	Species name	Threat category	Threat criteria
1	Phoca vitulina vitulina	VU/LC	D1/-
2	Phoca hispida botnica	VU	A3c
3	Halichoerus grypus	LC	-

2.2.6 Natural complexes requiring special protection

Applying the underwater biotops classification adopted by HELCOM for the Baltic Sea (including above 300 biotops) to the considered aquatic area along the Curonian Spit, we failed to distinguish biotops or natural complexes complying with 59 biotops included into the list of protected biotops for the Baltic Sea. However, in the other areas of the Russian South-East Baltic Sea such biotops are available (stony reefs with developed “underwater meadows”, the western edge of the Sambia Peninsula) and undoubtedly need the urgent adoption of protection measures and, probably, creation of local marine reserves for their preservation.

At the same time, in the area along the Curonian Spit the unique biotop has been found, which is absent in the list of the Baltic biotops and natural complexes, though totally complies with the definition of the natural complex “reef” except for the fact, that it is formed on the different type of deposits represented by dense Quaternary rocks and clay. They formed raised locations of several meters in height with specific indications of biogenic treatment on the surface.

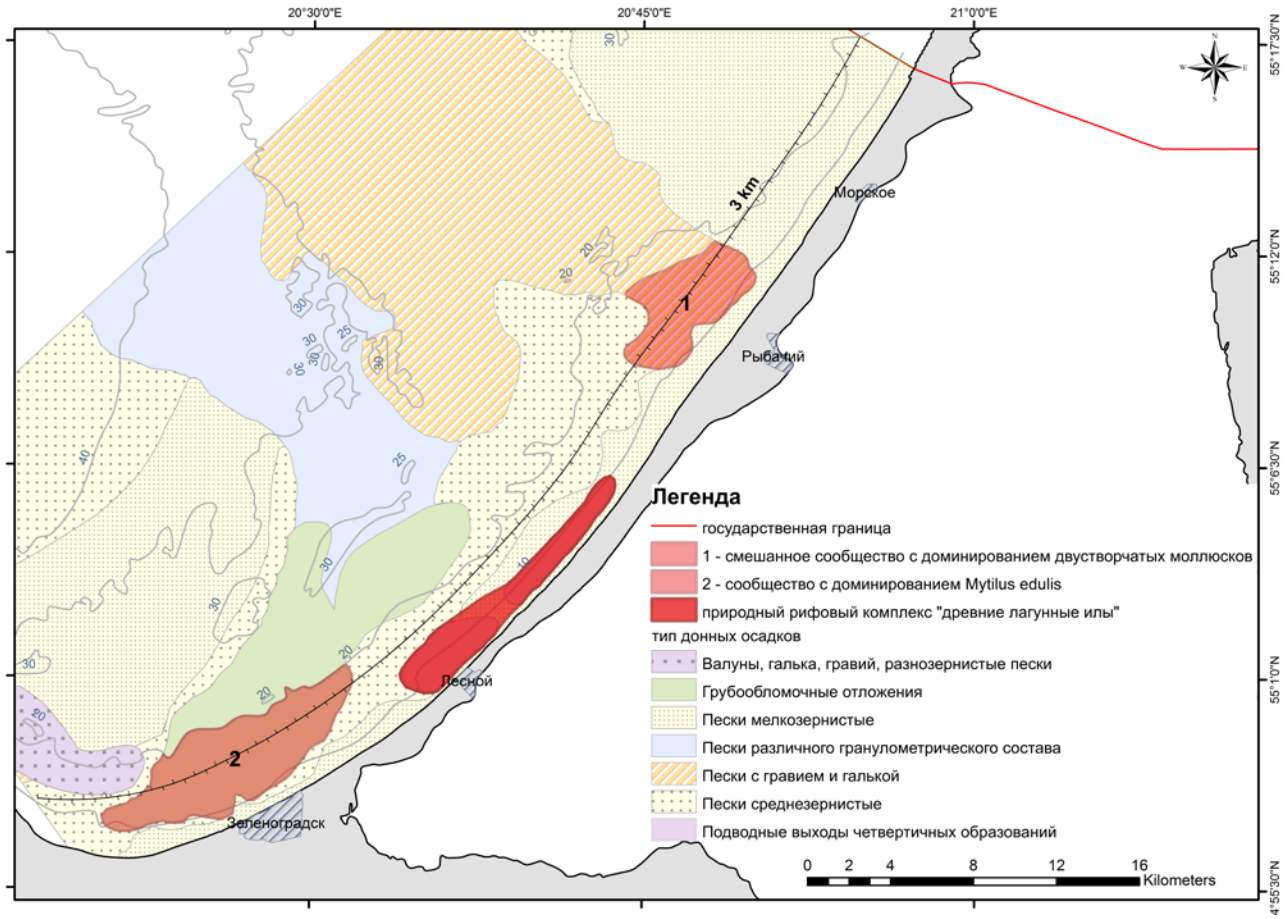


Fig 4. Location of the coastal areas proposed for different levels of protection aimed at preservation of valuable bottom communities.

2.2.7 Objects of historical-cultural heritage

The unique nature of the Curonian Spit has been attracted tourists for many years. It is the most interesting place for studying nature and historical-cultural heritage, where the natural processes are closely interrelating with the human activities. The Spit provides possibilities for scientific expeditions, students' practical work and observation of the living nature.

The main cultural significance of the territory of the Curonian Spit National Park is related to the relict *Curonian* (German-Curonian) cultural landscape of fishermen (settlements of fishermen, memorials of traditional architecture, locations of villages buried under sands, etc.) Besides, the afforestated dune complexes are of unique importance and may be considered as associative cultural landscapes, the evidence of overcoming the ecological crisis presenting the example of possible harmonious interaction of people and nature.

2.2.8 Analysis of the recreational potential of the territory

The short-term, mainly one-day visits of tourists to the National Park prevail.

The geography of the tourists arrival is the following: the major (89%) part of visitors arrive from Kaliningrad and Kaliningrad region. His group includes mostly independent ("wild") tourists arriving by the private and municipal transport, or as the members of excursion groups. Among the visitors of the Curonian Spit people from other Russian regions, primarily from Moscow and St.-Petersburg constitute 7%, and the citizens of foreign countries (mostly from Lithuania, Germany and Poland) comprise about 4%. The low number of tourists from other Russian regions is explained by the enclave position of the region and the lack of information about the National Park.

In terms of organization, non-organized tourism prevails. At present, the excursion services in the National Park territory are rendered by touristic companies.

The long-term dynamics of the average number of visitors to the National Park per day is presented below.

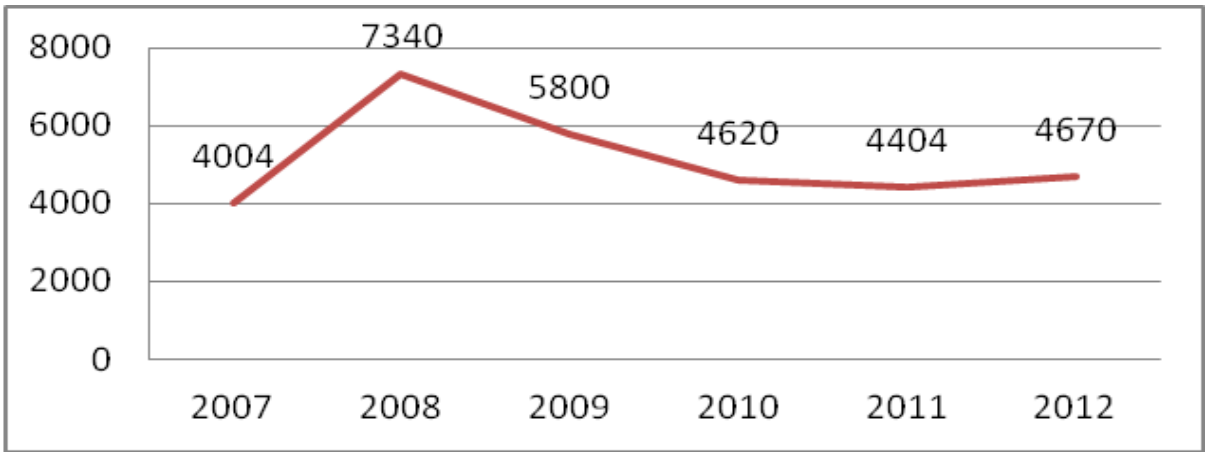


Fig. 5. Variability of the mean number of tourists of the National Park per day with the peak during 2007 – 2012 .

2.2.9 Proposals on arrangement of sports and recreational fisheries

Currently the sports and recreational fisheries in the Curonian Spit National Park are mainly represented by ice fishing in the Curonian Lagoon during the winter period, when thousands of people go onto the Lagoon ice-cover. In the coastal zone of the sea recreational fishery is not sufficiently developed. Its development is restrained by the lack of infrastructure and limitation of the National Park visiting. Evidently, that development of sports and recreational fisheries and tourism in the National Park should be provided as the balance between two opposite vectors – preservation of vulnerable natural complexes with restriction of movements within the Spit territory and development of tourism, including sports and recreational fisheries. The significance of this balance may be assessed only on the basis of comprehensive and careful research.

Potential development of sports and recreational fisheries is possible and desirable in two directions – fishing from the shore and off-shore fishing from boats. The following fish species may be caught from the shore: salmon, pike-perch, flounder, herring, garfish and mackerel. The main object of the off-shore recreational fishery is cod. Besides, such species as turbot, pike-perch, flounder also may be fished. Recreational fishery is regulated with respective provisions of the Fishing Rules, therefore, no additional regulation measures are required.

2.2.10 Probable location of stations for observation of sea birds and mammals

The location of stations for observation of sea birds and mammals depends on frequency and probability of the animals occurrence in certain areas. Mammals (3 species of pinnipeds) do not currently form any aggregations, regular seal-rookeries of adults and seal-calfs, reproduction grounds. Therefore, observation stations may be arranged near beach areas, where the individual seals appearance is most probable.

2.3 Assessment of ecological-economical situation

2.3.1 Economical exploitation of the coastal areas

Before 1939 the total population of the Russian part of the Curonian Spit constituted 965 persons. At present the municipal unit “The Agricultural Settlement Curonian Spit” includes 3 settlements with the total population of 1558 persons as at 1 January 2010, including 1001 persons in s. Rybachiy, 132 persons in s. Morskoye and 425 persons in s. Lesnoye. Out of this number the employable population constitutes 999 persons, people of the pension age — 325 persons, children and teenagers - 234 persons. In total 154 persons are engaged in the budgetary sector, 79 persons in agriculture and 450 persons in other sectors.

The economical activities in the sea coastal zone of the Curonian Spit, where the protected zone is planned, are actually not developed.

For the purpose of ***the near-shore fishery regulation*** in the Kaliningrad region, the whole coastal zone has been subdivided into fishing grounds in compliance with the Federal Law № 166-FZ “On fisheries and conservation of aquatic biological resources” adopted on 20 December 2004. . This Law specifies the assignment of the particular fishing ground to the user on the basis of a temporal agreement. Exploitation of this fishing ground by other users is allowed only by the consent of the prime user, to whom the fishing ground has been assigned on the basis of the agreement.

In compliance with the Letter of the West-Baltic Territorial Department of the Federal Agency for Fisheries (Rosrybolovstvo) No.06/10/1018 of 10.07.2013, twelve fishing grounds have been assigned in the Baltic Sea along the Curonian Spit. The agreement for these fishing grounds exploitation has been concluded between Rosrybolovstvo and the Fishery collective farm "Truzhennik Morya" for the period to 2026. One of the terms of the Agreement envisages the ban for the fishing right transfer to the third parties. The catch of aquatic biological resources (fishing gears, fishing methods, fishing periods) are strictly regulated by the Fishing Rules for the Western Fisheries Basin approved by the Order of Rosrybolovstvo № 393 of 10.12.2008.

As has been indicated before, in the proposed protected zone within 2.5-4.0 km from the coast-line of the Curonian Spit any trawl fishery with pelagic or bottom trawls is prohibited. The net fishery with fixed and drifter nets is totally prohibited in June-July and partially prohibited for some commercial species (cod, flounder, salmon) during specific seasons taking into account biological peculiarities of each species. Therefore, the fishing opportunities in the coastal sea zone of the Curonian Spit are considerably restricted, while the proposed protected zone up to 4 km in width has been actually excluded from the fishery.

On the proposed territory of the protected zone of the National Park ***no mineral deposits can be developed*** in spite of available acting licenses.

In compliance with the Letter of Kaliningrad Branch of FBU "Territorial Fund of Geological Information for the West-North Federal Region" the following minerals deposits are situated in the territory of the Curonian Spit National Park:

- deposit of sand (moulding materials) "Curonian Spit" recorded in the State Cadastre of Mineral Deposits (passport GKM B-58) is situated along the shore of the Curonian Lagoon between s. Lesnoye and the Lithuanian border. The deposit was explored in 1960-1962, however had not been recorded in the territorial balance-sheet of minerals deposits. From 1963 the development of this deposit had not been planned.
- deposit of sand (brick-tile raw material) "22nd **km of the Curonian Spit"** recorded in the State Cadastre of Mineral Deposits (passport GKM B-38) is situated at the 22nd km from t. Zelenogradsk in the Curonian Spit from the side of the Curonian Lagoon and at the distance of 250 m eastwards of the road Zelenogradsk-Klaipeda. This deposit was explored in 1966-68. In 1988 the sand deposit was withdrawn from the balance-sheet.

On the shelf of the Baltic Sea the following deposits are available:

- oil-field “Kravtsovskoye” recorded in the State Cadastre of Mineral Deposits (passport GKM D-15) is situated at the 44th km to the north of Zelenogradsk and far outside the boundaries of the proposed protected zone of the National Park. The oil-field is developed by OOO “Lukoil-Kaliningradmorneft” under the license.

- area of mineral resources ”Shelf of the Baltic Sea”. The license for the deposit exploration and development belongs to OOO “Lukoil-Kaliningradmorneft”. At the same time, in compliance with the Letter of the Sector of Geology and Licenses of the Department of Mineral Resources for the North-West Federal Region for the Kaliningrad region (Kaliningradnedra) № 298-i of 17.07.2013, the boundary of the area “Shelf of the Baltic Sea (Russian sector)” rendered to OOO “Lukoil-Kaliningradmorneft”, is fixed along the shore of the Curonian Spit from the point 9 (at 55°16'50.80"N and 20^{o}57'21.30" E) to the point 10 (54^{c}27'26.63" N and 19°38'30.96" E). Therefore the boundary is passing along the ***outer marine boundary of the buffer zone of the specially protected zone*** of the Curonian Spit and along the coast-line of the Baltic Sea.

Thus, the water area of the proposed protected zone of the National Park is outside the boundaries of the area “Shelf of the Baltic Sea (Russian sector)”rendered to OOO “Lukoil-Kaliningradmorneft”.

Recreational activities, tourism and resting on the beaches are the main kinds of the coastal zone exploitation.

2.3.2 Recreational disposal of the Curonian Spit, including near-shore territories. Basic elements of the modern infrastructure and development prospects

Touristic infrastructure in the natural territories. At present the natural territories of the National Park are provided with ecological routs, vision sites, places for resting, including picnics. Besides, the touristic infrastructure of the National Park outside the settlements includes 2 cafes near the most popular ecological footpaths “Dancing Forest” and “Dune Efa”, 19 parking sites for cars and 8 vision sites.

In the National Park territory, tourism is represented by 3 basic categories – cognitive, scientific and recreational.

The system of ecological footpath routs of the National Park includes 7 ecological footpaths of 13.4 km in total length. These routs provide the general information on the nature and history of the Curonian Spit. All footpaths are supplied with wooden covers, informational boards, pointers, specially arranged places for rest, vision sits, parking sites, containers for wastes and biotoilets.

Arranged sites for picnics. For the purpose of improvement of recreational services for tourists and to minimize the impact upon the nature of the Curonian Spit National Park, two sites have been specially assigned for camping and picnics arrangement: one in the area of the Visit-Center "Museum Complex" (at the 14th km of the Curonian Spit) and near the Lake Chayka, where up to 150 persons are able to rest at a time. The picnic sites are supplied with wooden furniture, braziers, stone place for fire, biotoilets and containers for wastes.

The Visit-Center "Museum Complex" is situated at the 14th km of the road Zelenogradsk-Klaipeda. About 20 thousand tourists are visiting the Museum annually.

The Station of Birds Ringing "Fringilla" is situated at the 23rd km of the Spit. Visitors can see the field work of the Biological Station of Institute of Zoology of the Academy of Sciences of the Russian Federation, The scientific activities at the Station include ringing of birds and research of their migrations.

The scientific tourism is currently represented by students and schoolchildren expeditions for studying the Curonian Spit nature and by specialized topical excursions.

Touristic infrastructure in the settlements. As at 2013, about 18 hotels and visitors' houses and 4 touristic bases and campings with the total capacity above 760 persons are available in the Curonian Spit. In addition, about 340 persons may rent rooms from the local inhabitants. Therefore, the total number of places with lodging for the night can be provided for about 1100 persons. Accommodation at the hotels is more popular among the tourists (67%), while the private sector is less developed (29%).

Social-cultural services are provided by the Municipal organization "Culture", being the cultural center for all categories of the Spit population. The number of residents of the Curonian Spit settlements constitutes about 1500 persons, while in summer the number of people considerably increases.

The informational services for tourists are provided by 2 private seasonal information centers located in s.Rybachiy and s. Morskoye. These information centers provide the following services: informational publications (leaflets, booklets, guide-books), accommodation of tourists in the private sector, leasing bicycles, selling souvenirs, arrangement of excursions, transportation, selling sim-cards for mobiles.

Infrastructure of the water tourism. As mentioned before, at present neither water tourism, nor water transport are developed in the Curonian Spit areas. The required infrastructure is also absent.

Shipping in the Curonian Lagoon is realized by the vessels of the Fishery Collective Farm “Truzhenik Morya” engaged basically in fishing and fish processing activities. The Curonian Lagoon is accessible to small fishing vessels during the navigation period lasting for 275 days on average.

Resting on the Curonian Spit beaches, mostly in the root of the Spit and near the settlements Lesnoy, Rybachiy, Morskoye and the touristic base “Dunes”, is very popular among inhabitants of Kaliningrad. In spite of the lack of equipped beaches (changing huts, buoys, rescuers), the number of resting people on the beaches from Zelenogradsk to Morskoye in the peak season may approach 60,000.

2.3.3 Anthropogenic impact upon the coastal water ecosystem

Discharge of industrial wastes of Kaliningrad and the towns of Pregolya basin, Gdansk industrial district, basins of Vistula and Neman and Klaipeda industrial district constitutes the basic source of industrial pollution. At the same time considerable part of contaminants does not enter the sea, but accumulates in the Curonian Lagoon, where the water is self-purified to considerable extent.

The coastal sea waters to the north-west of Yantarniy are permanently affected by the pulp discharge associated with the amber mining. The discharge of pulp does not cause pollution, however, it is one of the major factors affecting the granulometric composition of the near-shore soils along significant distance, though this effect has not been studied yet.

The ecosystem of the coastal waters is able to cope with considerable background pollution resulted from the municipal and industrial discharge and with other forms of anthropogenic impact. The coastal biota plays a very important role in the process of the sea self-purification. Macrophites, zooplankton, phytoplankton, bivalve molluscs are binding suspended organic particles, dissolved organic matter and accumulate salts of metals; gastropods are utilizing coarse organic particles and detritus; microogranisms are decomposing the residual detritus and oil products. Bivalve molluscs play particularly important role in the process of the sea self-purification. Each specimen of *Mytilus edulis* is able to filtrate up to 40-50 liters of water per day removing suspended hard particles of organic and non-organic origin and a part of dissolved organic matter from the water. Filtered microorganisms and hard organic particles pass to the digestive system of the mollusc-filtrator, while “uneatable” particles are deposited on the mucus layer covering the mantle surface and are discharged through the siphon. Molluscs remove contaminants from the water and make them accessible to the animals consuming detritus.

3. PROPOSALS ON DELIMITATION OF THE PROTECTED ZONE OF THE CURONIAN SPIT NATIONAL PARK FROM THE SIDE OF THE BALTIC SEA

3.1. Substantiation of expediency of proposed aquatic areas inclusion into the boundaries of the protected zone of the National Park

According the acting "Federal Law on the Specially Protected National Territories" (Clause 10), the protected zones should be created in the adjacent land and aquatic areas of the state natural reserves, national parks, natural parks and memorials of nature to prevent unfavorable anthropogenic impact. The procedure of protection zones creation and definition of their boundaries, as well as setting the regime of protection and usage of lands and aquatic areas within the protected zones is elaborated by the Government of the Russian Federation. The regime of protection and usage of lands and aquatic areas within the protected zones is determined by the Regulations on the Protected Zone, approved by the governmental body adopting the decision on the protected zone creation.

In regard of the national parks, the decision on creation of protected zones and their boundaries is adopted by the Federal executive authorities responsible for respective specially protected natural territories (Clause 11).

It is important to note, that poor ecological protection of the Curonian Spit is stipulated by the shape of the peninsula, since the distance from any inside point to the Spit boundaries is quite short. The objective criterion of the natural territory protection is the ratio of its area to perimeter. For the Curonian Spit National Park this ratio is the lowest in Russia — 0.25, while for the majority of reserves in the European part of Russia this ratio varies from 1 to 5.

For the Curonian Spit National Park the basic object of protection from unfavorable anthropogenic impact is the Spit itself being a unique and very vulnerable geomorphologic formation. The formation, usually named a spit, is represented by the top of a long sand ridge rising from the sea depths. As has been mentioned before, the efficient near-bottom currents and, consequently, the sand flows feeding interspersing, are observed on the submerged sea slope up to the 20-m isobath. Therefore, the submerged sea slope up to the 20-m isobath is the integral part (socle) of the exposed part of the spit directly affecting its stability. This important part of the near-shore aquatic zone should be primarily protected from the anthropogenic impact destructing the lithogenic basement and the dynamic stability of the entire natural complex – large-scale engineering works and mineral deposits development.

Besides, ecosystems of the near-shore aquatic zone are closely connected to the land natural complexes of the National Park with numerous ecological ties or include natural objects of their own ecological importance.

To provide conditions for the long-term preservation of the Curonian Spit, the entire ecosystem, not only its land part, should be included into the protected zone, since the economical exploitation of the adjacent water areas directly affects its stability.

Therefore, establishment of the protected zone including near-shore sea areas is legally and ecologically justified way of optimization of the currently available system of the Curonian Spit National Park protection.

In the near-shore areas of the sea along the Curonian Spit the unique and especially valuable natural complexes and objects are observed, as well as the rare and protected species of plants and marine invertebrates. The near-shore zone of the Curonian Spit is also associated with the highest concentration of zooplankton intensively consumed by sprat, smelt and herring. Actually all young fish of these species are feeding on zooplankton in the near-shore zone and the annual migration of young herring occurs there as well.

The sea shelf of the Curonian Spit constitutes a part of the feeding grounds of the Baltic population of common seal, Baltic gray seal and Baltic ringed seal entered into the Red Book of the Russian Federation. The migration routes of the Baltic sturgeon and sea trout, also entered into the Red Book of the Russian Federation, are passing along the Curonian Spit shores. Within the boundaries of the proposed protected zone twice a year hundred thousands of marine and near-water birds are migrating along the White Sea-Baltic Sea route to the West and South Europe and Africa and stay for resting on the Spit. Nine of these bird species are entered into the Red Book of the Russian Federation. In non-freezing near-shore areas abundant wintering aggregations of sea ducks are concentrated.

Therefore, creation of the protected zone of the National Park will contribute considerably to preservation of biological diversity in the South-East Baltic Sea.

Creation of the protected zone of the National Park will become the evidence of the fact, that Russia fulfills its commitments to HELCOM. This will not only facilitate the implementation of several international conventions, ratified by Russia, but will also provide a considerable contribution into development of specially protected natural territories of Russia and Kaliningrad region in particular.

Preservation of birds populations and biological diversity in the entire European continent directly depend on successful migrations of the birds along the Curonian Spit.

The protected zone regime is a compromise, which allows combining the restricted economical and recreational activities with the objectives of preservation of valuable natural complexes. Any activities of the National Park will require coordination with the supervising authorities and owners of the right to develop mineral deposits and carry out fishery. At the same time, the protected zone regime gives the right to the inspectors of the National Park to control the use of natural resources in the protected zone.

3.2. Description of the proposed protection zone boundaries

To preserve the integrity of the natural complexes of the Curonian Spit as a unified landscape formation, the protected zone of the National Park will be created in the 12-mile zone of the internal sea waters and territorial sea of the Russian Federation adjacent to the western coast of the Curonian Spit with the boundaries along the 20-m isobath (about 2.5-4 km from the coast-line).

As has been noted before, this part of the sea slope is an integral part (socle) of the exposed part of the Spit and directly affects its stability. The analysis of the most valuable objects distribution confirms the expediency of passing the boundary along the 20-m isobath. The marine boundary of the Curonian Spit National Park in Lithuania is also located along this isobath, though the distance from the shore does not exceed 2.5 km there.

At last, it is necessary to acknowledge that the aquatic boundaries of the protected zone are reasonable to be fixed along the 20-m isobath, since it is marked in the most maps of the coastal areas of the South-East Baltic Sea. At the same time, in view of complex configuration and variability of the isobath line in this area, the boundaries must be drawn along the strait lines connecting turning reference points.

Therefore, the boundary of the protected zone of the National Park is proposed to set in the sea parallel to the 20-m isobath at the distance 2.5-4 km from the shore-line and to extend it further at the same distance from the shore in the moraine island area near s.Rybachiy, where it protrudes too far into the sea.

The geographic coordinates of the turning reference points of the protected zone of the National Park are fixed in the coordinate system WGS-84. The map of the protected zone of the National Park is presented in the Appendix.

The boundary of the protected zone begins at the point, where the southern boundary of the square 77 of Zelenogradsk district forestry of the Curonian Spit National Park crosses the shore-line of the Baltic Sea (point 1 at 54°58'4.05"N, 20°29'39.98"E) and passes through the following points:

2	55°0'15.40" N	20°27'35.51" E
3	55°1'8.90" N	20°31'10.95" E
4	55°2'39.00" N	20°34'36.46" E
5	55°3'50.54" N	20°37'36.61" E
6	55°7'2.24" N	20°41'27.12" E
7	55°7'27.90" N	20°42'30.95" E
8	55°9'16.57" N	20°42'54.80" E
9	55°11'54.07"N	20°46'45.65" E
10	55°13'51.95"N	20°51'7.33" E
11	55°14'21.95" N	20°51'9.34" E
12	55°14'57.34" N	20°51'57.03"E
13	55°15'3.01" N	20°52'25.89" E
14	55°17'22.43" N	20°55'42.43"E

up to the state border of the Republic of Lithuania.

The total area of the protected zone of the National Park within the above indicated boundaries constitutes 15517 ha.

3.3. Functional-regime structure of the aquatic areas proposed for inclusion into the protected zone of the National Park

The protected zone regime is aimed at ensuring conservation of living and reproduction grounds of marine fauna and flora (including birds and marine mammals), spawning and feeding grounds of commercial fish species and to facilitate development of the coastal forms of tourism and recreation within the limits acceptable for preservation of the natural communities.

Within the protected zone boundaries the following activities are prohibited:

- bottom-dredging, explosive and drilling works;
- exploration and mining of mineral resources;
- laying pipes and other communications, except for those necessary for the National Park and its inhabitants vital activities;

- activities related to disposal (storage and burial) and utilization of industrial, municipal wastes, radioactive, chemical, explosive, toxic substances and poisons;
- discharge of oil products (including wastes) from vessels and other sailing craft;
- discharge of hazardous substances, industrial and municipal wastes, oily, household and faecal sewage from vessels, other sailing craft, aircraft;
- intentional introduction of alive organisms for the purpose of their acclimatization;
- actions resulting in disturbance and frightening away marine mammals and birds, as well as attracting and feeding them;
- commercial, sports and recreational hunting;
- catching all species of aquatic biological resources with any trawl fishing gears during the entire year, and during the period from 1 June to 31 July fishing with any fishing gears is prohibited in compliance with the Fishing Rules for the West Fishery Basin, approved by the Order of Rosrybolovstvo No. 393 of 10.12.2008 with subsequent amendments and supplements;
- movement of any motor sailing craft within the 5-m isobath (400 m from the shore-line), except for the craft of the governmental organizations implementing public ecological control and supervision, guarding the state border, maintaining the law and order, preventing and liquidating emergency cases and rescuing people (Inspection Board for the National Park territory guarding, Border Department of FSB of Russia, police, Fishery Supervising Board of Russia "Rosrybnadzor", Emergency Service, etc.), as well as the sailing craft of persons having licenses for commercial fishing activities.

Within the protected zone boundaries the following activities are allowed:

- commercial fisheries within the areas allocated in compliance with the Fishing Rules for the West Fishery Basin and the present Regulations;
- recreational and sports fisheries from the shore and from the water in compliance with the Fishing Rules for the West Fishery Basin and the present Regulations;
- fishery melioration without introduction of alive organisms;
- activities on protection and recovery of the Spit shores, approved by the ecological experts examination;
- recreational usage of the aquatic areas (swimming, recreational fishery, diving, kiting, yachting, etc.), including construction of required berths and beach equipment;
- fulfillment of ecological monitoring, nature protection and biotechnical measures, scientific research and ecological educational activities;

- other kinds of activities implemented in compliance with the acting ecological legislation and without any damage for the nature complexes and objects of the National Park.

Taking into account the requirements of the recreational fishery and tourism, the transport corridors of 300 m in width will be provided for motor sailing craft entering outside the 5-m isobath near s. Lesnoy, Rybachiy and Morskoye.

The principle of functional zoning is taken as a basis of the approach to the conservation of the National Park natural complexes. It means that the entire territory of the National Park is divided into functional zones with different purpose assignment, taking into account the peculiarities of their preservation and exploitation and ability to sustain the loads related to the exploitation.

The same approach of differentiation of the sea areas territorial-regime structure should be applied to the protected zone of the National Park as well.

Taking into consideration availability of especially valuable and especially vulnerable ecosystems, the specially protected locations will be determined within the protected zone, where fishing and mass recreational activities are totally prohibited. Only scientific, educational and ecological-informational usage of these locations will be allowed.

The specially protected locations are fixed in the areas restricted with the lines passing perpendicularly to the shore-line and situated between 14th and 16th km, 23rd and 28th km, 38th and 49th km (up to the Lithuanian border) of the Curonian Spit, except for the beach zone near s. Morskoye.

3.4. Arrangement of protection and using of the aquatic areas of the protected zone

The aquatic areas within the protected zone used by owners, landholders, land users, leaseholders, servitude holders will not be withdrawn. The exploitation of the aquatic areas and natural resources of the protected zone should be governed by the legislation of the Russian Federation and the Regulations on the Protected Zone, approved according to the adopted procedure.

The boundaries and regime of the protected zone should be taken into consideration in elaboration of plans and prospects of the economical and social development, preparation of documents for the territorial planning. The information on the protected zone boundaries should be entered into the documents of the State Cadastre of Real Estate according to the adopted procedure.

The Federal State Budgetary Institution “Curonian Spit National Park” (hereinafter “Institution”) implements the following functions within the protected zone:

- protection of the natural complexes and objects aimed at conservation of biological and landscape diversity;
- state supervision over protection and use of the specially protected natural territories;
- fulfillment of scientific-research tasks;
- ecological monitoring;
- ecological-educational activities and development of cognitive tourism;
- realization of other functions in compliance with the present Regulations and the laws of the Russian Federation.

The time, methods and means of scientific-research activities planned by fishery, scientific and other organizations should be coordinated with the Institution.

In the protected zone territory any shooting and catching the fauna representatives for scientific purposes should be coordinated with the Institution.

The persons having licenses for commercial fishery, issued in compliance with the adopted procedure, should coordinate in the written form with the Institution the time (periods), locations, amount of catch, fishing gears and methods of fishing the aquatic biological resources in the protected zone of the National Park.

The boundaries of the protected zone will be indicated in maps. The information on restriction of navigation in the internal sea waters and territorial waters of the Russian Federation, included into the protected zone, will be published in the “Notifications for Navigators”.

Individuals and legal entities guilty of breaching the adopted regime or any other rules of protection and usage of the environment and natural resources within the protected zone, should be punished in compliance with the procedure set by the law.

The protected zone regime is maintained by the state inspectors for the National Park territory protection, as well as by means of joint raiding together with fishery inspectors of the West-Baltic Territorial Department of Federal Agency for Fisheries, representatives of police, Border Department of FSB of the Russian Federation for Kaliningrad region and other executive authorities and public fishery inspectors.

4. SOCIAL-ECONOMICAL CONSEQUENCES OF CREATION OF THE PROTECTED ZONE IN THE NATIONAL PARK

At present the territory of the Curonian Spit National Park is actively engaged in the recreational-touristic activities. The annual number of visitors exceeds 200 thous. persons.

The Regional Ministry of Tourism proposed to provide 5.967 mln. rubles for placement of informational materials describing the touristic attractiveness of the Kaliningrad region in the Russian and foreign news media in 2014. This sum is three times higher than the funds assigned for promoting touristic attractiveness of the region in the previous years (2 mln. rubles).

Currently the assessment of the combined economic effect from the extension and future activities of the National Park as the integral nature-protective, scientific, ecological-educational and recreational-touristic complex is not possible. The efficiency of humanistic and biospheric activities of the National Park (protection of the natural and cultural-historical heritage, preservation of unique natural complexes and genetic fund of rare species, ecological education, etc) are also beyond the economical estimation. Any reliable methods of estimation of the direct economical effect from the extension of the economical and cultural-domestic sphere in the National Park, increase of trading companies turnover, appearance of additional working places are absent now. However, just these factors stipulate the attractiveness of protected natural territories for tourists. No doubt that visiting the reserve affects positively both physical and emotional health and working capacity of people.

In this document the calculations are presented to provide preliminary assessment of economical losses related to withdrawal of natural resources due to the extension of the National Park aquatic areas, as well as the basic financial expenses required to implementation of the tasks and objectives of the proposed extending the aquatic areas of the Curonian Spit National Park.

4.1. Losses related to ceasing the natural resources extraction

4.1.1. Losses related to ceasing commercial fisheries

The proposed regime of the protected zone of the National Park does not prohibit commercial fisheries in compliance with the adopted rules.

However, the potential losses for the fishery resulted from to exclusion of the near-shore zone of the Curonian Spit out of the fishing grounds can be estimated as follows:

In the Kaliningrad region waters the trawl fishery catch constitutes 96.7% of the total catch. In compliance with the Fishing Rules in the near-shore zone of 6 n. miles in width (or 11.1 km) the trawl fishing is prohibited during the entire year, therefore, it is possible to ignore it in calculations. It is known that the length of the shore-line of the Baltic Sea in the Kaliningrad region is 143.6 km, while the length of the shore-line of the Baltic Sea in the Russian part of the Curonian Spit is 44.4 km or 1/3 of the total fishing zone in the near-shore waters, where fixed nets are used as a fishing gear. Fishing with fixed and drifter nets in the whole aquatic area amounts to 3.3% of the total catch of aquatic bioresources in the territorial waters and economic zone of the Russian Federation in the Kaliningrad region (Subdivision 26 of the Baltic Sea). Actually the entire net fishery is carried out in the territorial waters of the Russian Federation of 12 n.miles in width (or 22.2 km). Taking into account the length of the shore-line of the proposed protected zone of the Curonian Spit National Park constituting 1/3 of the entire near-shore fishing zone (territorial waters), the catch from this area will equal to 1.1% of the total catch. As far as the width of the protected zone, excluded from the fishery is 4 km or 1/5 of the potential area of net fisheries in the territorial waters of Russia in the near shore part of the Curonian Spit National Park, the losses will amount to 0.2% of the total catch in the Kaliningrad region. Based on the data for 2010 (the year-to-year variability of the data is insignificant) the losses will constitute not more than 66 t per year. Taking into consideration the fact, that annual catch quotas have not been taken up (and even if they are taken up), prohibition of the commercial fishery in the proposed protective zone will not actually affect the fisheries in the Kaliningrad region in general.

At the same time, creation of the protected zone of the National Park will facilitate recovery of the ecosystem in the near-shore waters, which, in turn, will positively affect the fish resources and improve the prospects of recreational fishery development.

4.1.2. Losses related to prohibition of the mineral resources extraction

In the Kaliningrad region amber, peat and halite are extracted. However, all these resources are located outside the protected zone of the National Park, therefore, creation of the protected zone cannot affect their extraction.

In the territory of the proposed protected zone of the National Park any development of the mineral resource under acting licenses is absent.

On the shelf of the Baltic Sea the oil-field is situated. According to the Letter of the Sector of Geology and Licenses of Department of Mineral Deposits Exploitation of the North-West Federal District for the

Kaliningrad region (Kaliningradnedra) No. 298-i of 17.07.2013, the boundary of the area "Shelf of the Baltic Sea (Russian sector)", transferred to OOO "Lukoil-Kaliningradmorneft", along the coast-line of the Curonian Spit from the point 9 (at 55°16'50.80" N and 20°57'21.30" E) to the point 10 (54°27'26.63" N and 19°38'30.96" E) is passing ***along the outer marine boundary of the buffer zone of the specially protected territory of the Curonian Spit*** and along the shore-line of the Baltic Sea.

Therefore, the aquatic area of the proposed protected zone of the Curonian Spit National Park ***is outside the boundaries of the area*** "Shelf of the Baltic Sea (Russian sector)" transferred to OOO "Lukoil-Kaliningradmorneft".

Creation of the protected zone of the National Park will not lead to any losses in the sector of mineral resources extraction in the region.

4.1.3. Losses for the agricultural sector

Creation of the protected zone of the National Park in the sea areas cannot lead to any losses in the agricultural sector of the region.

4.1.4. Losses for the hunting sector

Any commercial, recreational and sports hunting is prohibited in the Curonian Spit. Therefore, creation of the protected zone of the National Park in the sea areas cannot lead to any losses in the hunting sector of the region.

4.1.5. Restriction of recreational use of the aquatic areas

Creation of the protected zone of the National Park in the sea areas cannot lead to any losses in the recreational usage of the region, since no additional restrictions will be introduced. On the contrary, the extension of the protected aquatic area will promote the increase of the recreational potential and development of recreational and sports fisheries.

Taking into account the fact, that the recreational fisheries will be arranged by individuals or commercial organizations, creation of the protected zone of the National Park in the sea areas cannot lead to any additional budgetary expenditures in this sector. The respective supervising authorities will be able to execute their functions under the existing procedure.

4.2. Financial expenditures related to creation of the protected zone of the Curonian Spit National Park

The proposed creation of the protected zone of the Curonian Spit National Park in the aquatic areas of the Baltic Sea will not require any additional expenditures for arrangement of appropriate capital infrastructure.

The expenditures related to creation of the protected zone of the National Park during the initial period (1-3 years) will amount to about 7464.8 thous. rubles.

Any additional expenses and probability of funds saving in the process of arrangement of the joint works of the National Park inspectors and the state border guard department, Rybnadzor (fishery inspection) and the Ministry of Emergency Situations may be assessed only after beginning of the protected zone functioning within the established boundaries.

5. CONCLUSIONS

The purpose of this document is granting the legal status of the protected zone to the sea areas adjacent to the Curonian Spit National Park aimed at preservation of the ecological integrity of the natural complexes in the National Park and at maintenance the biological diversity in the southern part of the Baltic Sea. The immediate task is to prepare Materials of the complex environmental examination of the sea areas substantiating granting these areas the legal status of the protected zone of the Curonian Spit National Park.

The protected zone of the National Park is created to protect the unique natural complexes of the Curonian Spit against unfavorable anthropogenic impact, conservation of the typical near-shore communities of the South-East Baltic Sea, spawning and feeding grounds of young commercial fishes and protection of marine birds and mammals during migration and reproduction periods.

Creation of the protected zone is a compromise decision, which allows to combine the restricted economical and recreational activities with the objectives of conservation of valuable natural complexes. At the same time, the protected zone regime enables the inspectors of the National Park to control the nature usage within this territory (aquatic areas).

In the process of investigation the physical-geographic and landscape peculiarities of the Curonian Spit, the history of its formation, flora and fauna of the sea coastal zone have been analyzed and the most valuable natural and historical-cultural objects and possibilities of the recreational usage of the coastal zone have been revealed.

For Curonian Spit National Park the main object of protection is the spit itself, as the unique and extremely vulnerable geomorphological formation. The formation, usually named a spit, is represented by the top of a long sand ridge rising from the sea depths. The active near-bottom currents and, consequently, the sand flows feeding interspersing, are observed on the submerged sea slope up to the 20-m isobath. Therefore, the submerged sea slope up to the 20-m isobath is the integral part (socle) of the exposed part of the spit directly affecting its stability. This important part of the near-shore aquatic zone should be primarily protected from the anthropogenic impact.

Besides, ecosystems of the near-shore aquatic zone are closely connected to the land natural complexes of the National Park with numerous ecological ties or include natural objects of their own ecological importance.

To provide conditions for the long-term preservation of the Curonian Spit, the entire ecosystem, not only its land part, should be included into the protected zone, since the economical exploitation of the adjacent water areas directly affects its stability.

Therefore, establishment of the protected zone including near-shore sea areas is the legally and ecologically justified way of optimization of the currently available system of the Curonian Spit National Park protection.

In the coastal zone of the sea along the Curonian Spit the unique and especially valuable natural complexes and objects are situated, rare and protected species of marine plants and invertebrates are living. Besides, the largest concentration of zooplankton, intensively consumed by sprat, smelt, herring and juveniles of other commercial fish species, is also associated to the coastal zone of the Curonian Spit.

The sea shelf of the Curonian Spit constitutes a part of the feeding grounds of the Baltic sturgeon and sea trout, the Baltic population of common seal, Baltic gray seal and Baltic ringed seal entered into the Red Book of the Russian Federation. Twice a year hundred thousands of sea and near-water birds are migrating along the White Sea-Baltic Sea route to the West and South Europe and Africa and stay for resting on the Spit. Nine of these bird species are entered into the Red Book of the Russian Federation. In non-freezing near-shore areas abundant wintering aggregations of sea ducks are concentrated.

Therefore, creation of the protected zone of the National Park will contribute considerably to preservation of biological diversity in the South-East Baltic Sea.

To preserve the integrity of the natural complexes of the Curonian Spit as a unified landscape formation, the protected zone of the National Park is proposed to be created in the 12-mile zone of the internal sea waters and territorial sea of the Russian Federation adjacent to the western coast of the Curonian Spit with the boundaries along the 20-m isobath (about 2.5-4 km from the coast-line). At the same time, in view of the complex configuration and variability of the isobath in this area, the boundaries will be fixed along the straight lines connecting the turning reference points.

The total area of the protected zone is about 15.5 thous. ha.

The regime of the protected zone is to provide preservation of habitats and reproduction areas of marine flora and fauna (including birds and marine mammals), reproduction and feeding grounds of commercial fish species and to promote development of the near-shore tourism and recreation

within the limits acceptable for preservation of the natural communities.

Taking into consideration availability of especially valuable and especially vulnerable ecosystems, the specially protected locations will be determined within the protected zone, where fishing and mass recreational activities are totally prohibited. Only scientific, educational and ecological-informational usage of these locations will be allowed.

The draft Regulations on the Protected Zone of the Curonian Spit National Park has been elaborated. The Regulations should be approved by the Ministry of Natural Resources and Ecology of the Russian Federation upon coordination with the Head of the main executive body of the governmental authorities in the Kaliningrad region, Federal Agency for Mineral Resources Development, Federal Agency for Aquatic Resources, Ministry of Transport of the Russian Federation, Federal Security Service of the Russian Federation.

Creation of the protected zone of the National Park is the evidence of fulfillment by Russia its commitments to HELCOM. This measure will not only facilitate execution of several international conventions, ratified by Russia, but, first of all, will make a significant contribution into development of specially protected natural territories in Russia and Kaliningrad region. Preservation of birds populations and biological diversity in the entire European continent depends directly on successful migrations of birds along the shore of the Curonian Spit.

Creation of the protected zone of the National Park in the sea areas of the Curonian Spit within the proposed boundaries will allow to form the specially protected territory, which is very important to scientific activities, conservation of biological diversity and ecological education. Besides, it will allow to connect structurally the national parks of Russia and Lithuania into the integral ecological complex. This measure will indeed facilitate implementation of the adopted Ecological Doctrine in the area being vitally important for the Kaliningrad region and the whole Russia.

Appendix 1.
Annotated list of ichthyofauna in the littoral and coastal zones of the Curonian Spit of the Baltic Sea (+ - rare species; ++ - common species; +++ - abundant species).

№	Russian and Latin name	Biological information	Occurrence	State of the stock and precautions (entered into the Red Book, etc.)
1	European lamprey – *Lampetra fluviatilis* (Linnaeus, 1758)	30-35 cm in length. A transient species. In spring and autumn it migrates into the rivers from the sea for spawning. No feeding during migrations. Died after spawning. Larvae are feeding on small bottom organisms.	+	A rare species, however, not of concern. Excluded from the Red Book of the Russian Federation in 1999
2	Baltic sturgeon – *Acipenser oxyrinchus* Mitchill, 1815	Up to 2.5 m in length. A transient species. Occurred in the Baltic Sea till the mid-20th century. Spawned in the rivers Neman, Vistula, Pregolia. Feeding on bottom species, including fish.	+	Entered into the Red Book as *A. sturio*. The international project for this species recovery in the area is implemented. Individual young specimens have been occasionally caught in the Curonian Spit zone. `The subject of aquaculture.
3	Baltic salmon - *Salmo salar* Linnaeus, 1758	A large fish up to 1.5 m in length and up to 39 kg in weight. The life cycle is from 8 to 9 years. Transient species. Spawning in autumn. Feeding on crustaceans and fish.	++	Commercial species. Satisfactory state of the stock in the sea. The subject of artificial raring in Poland and Lithuania.
4	Sea trout- *Salmo trutta* Linnaeus, 1758	Large fish up to 70 cm in length and up to 14 kg in weight. The life cycle is from 8 to 9 years. A transient species. Spawning in autumn, Feeding on small fish.	++	Commercial species. Satisfactory state of the stock in the sea due to restocking in the Vistula basin. Entered into the Red Book of the Russian Federation, Poland and Lithuania. The subject of aquaculture.
5	Whitefish – *Coregonus lavaretus* (Linnaeus, 1758)	25-35 cm in length and 175-460 g in weight. Maturity appears at 4-8 years of life. A transient species. Spawning in October-November. Feeding on invertebrates. Artificial rearing.	+	The state of the stocks is unsatisfactory. Entered into the IUCN Red List as a vulnerable species (IUCN Red List, 2010). The subject of artificial rearing and aquaculture.
6	Smelt - *Osmerus eperlanus* (Linnaeus, 1758)	Up to 30 cm in length, usually from15 to 25 cm. Up to 40 g in weight. Maturity appears at 3-4 years of life. A transient species. Spawning in February-April depending on the water temperature. Feeding on plankton.	++	Commercial species. The state of the stock is satisfactory, however, abundance fluctuations are very pronounced.

7	Sprat - *Sprattus sprattus* (Linnaeus, 1758)	Up to 14 cm in length. Spawning in April-August. Pelagic eggs. Feeding on plankton and fish larvae.	+++	Commercial species. The state of the stock is good. The subject of the trawl fishery.
8	Baltic herring - *Clupea harengus membras* (Linnaeus, 1758)	14-18 cm in length. Spawning in March-May and October-November in lagoons. The form is known spawning in the coastal zone of the sea on algae aggregations. Plankton-eater.	+++	Commercial species. The stock exhibits the trend towards decrease. The sea population has actually disappeared after disappearance of algae aggregations in the coastal zone. In 1960s-1970s the fishery was carried out in the sea using fixed nets.
9	Shad - *Alosa fallax* (Lacepède, 1803)	Up to 53 cm in length. A transient species. Spawning in June-July in the Neman river. Predator.	++	Commercial species. Excluded from the Red Book of the Russian Federation due to the stocks recovery.
10	European eel - *Anguilla anguilla* (Linnaeus, 1758)	32-72 cm in length and 0,.5 – 1.0 kg in weight. Maturity at 8 - 12 years of life. A catadromous species. Mature silver-color specimens migrate for spawning into the ocean. Glassy larvae migrate to the shore and further into the rivers of Europe. An euryphagous species.	+	The stock in the state of depression due to insufficient natural recruitment. Entered into the IUCN Red Book as a species in the critical state. The international program of this species stocks recovery is implemented. The subject of aquaculture.
10	Roach - *Rutilus rutilus* (Linnaeus, 1758)	Up to 30 cm in length. Up to 600-800 g in weight. Maturity at 3-5 years of life. Spawning in spring in April-May. In summer the species migrates into the sea for feeding. Feeding on bottom organisms.	+	Commercially unimportant in the sea.
11	Bream- *Abramis brama* (Linnaeus, 1758)	Up to 0.5 m in length. Масса до 5 кг. Maturity at 3-4 years of life. Spawning in the late April-early May. In summer the species migrates into the sea for feeding. Feeding on bottom organisms and algae.	+	Commercially unimportant in the sea.
12	Vimba - *Vimba vimba* (Linnaeus, 1758)	Up to 50 cm in length. масса до 3 кг. Maturity at 4-5 years of life. A semi-transient species. Spawning in May-June on rock bars. In summer the species migrates into the sea for feeding. Feeding on bottom organisms and small fish.	+	Commercially unimportant in the sea.
13	Garfish - *Belone belone* (Linnaeus, 1761)	Up to 90 cm in length. During the feeding migration the species enters from the North Sea. Predator.	+	The subject of the sports fishery. Commercially unimportant.

14	Baltic cod - *Gadus morhua* Linnaeus, 1758	Up to 1.2 m in length, usually from 40 to 50 cm. Spawning in May-August. Pelagic eggs. Predator.	++	Commercial species. Considerable reduction of the stock has been observed.
15	Perch - *Perca fluviatilis* Linnaeus, 1758	Up to 50 cm in length and up to 1.5 kg in weight. Maturity at 2-4 years of life. Spawning in spring in April-May. In summer the species migrates for feeding into the sea. Feeding on bottom invertebrates and small fish.	+	Commercially unimportant in the sea.
16	Pike-perch - *Sander lucioperca* (Linnaeus, 1758)	Up to 1.3 m in length and up to 20 kg in weight. Maturity at 4-7 years of life. Spawning in spring. Constructs nests. A male guards eggs. A semi-transient species. In the coastal zone of the sea feeding specimens are observed. Feeding on fish.	++	Commercial species. The state of the stocks is satisfactory.
17	Rock eel - *Pholis gunnellus (*Linnaeus, 1758)	Up to 25 cm in length. The species is found just near the shore in stony placers. Spawning is in autumn. Feeding on invertebrates.	+	Commercially unimportant. The species is quite rear in conditions of the sandy littoral zone of the Spit.
18	European ocean pout- *Zoarces viviparus* (Linnaeus, 1758)	Up to 18-25 cm in length. Occurs in stony and sandy littoral zone. Sustains strong desalination of the water. Viviparous fish. An euryphagous species.	+	Commercially unimportant. The species is quite rear in conditions of the sandy littoral zone of the Spit.
19	Lesser sand eel- *Ammodytes tobianus* Linnaeus, 1758	Up to 20 cm in length. In summer the abundant aggregations are observed at the sandy water edge. The fishes are burying into sand. Spawning in summer. Eggs are buried into sand. Feeding on zooplankton.	+++	Potentially commercial species.
20	Mackerel – *Scomber scombrus* Linnaeus, 1758	Up to 50 cm in length. Sometimes enters from the North Sea. No spawning in the Baltic Sea. Predator.	+	Commercially unimportant.
21	Sand goby - *Pomatoschistus minutus* (Pallas, 1770)	Up to 5 cm in length. Inhabits sandy grounds of the littoral zone. Spawning in summer. Feeding on small zoobenthos.	+	Commercially unimportant.
22	Common goby - *Pomatoschistus microps* (Krøyer, 1838)	Up to 5 cm in length. Inhabits sandy grounds. Spawning is protracted from February to September. Males guard eggs. Feeding on small zoobenthos.	+	Commercially unimportant.
23	Round goby - *Neogobius melanostomus* (Pallas, 1814)	Up to 25 cm in length. Inhabits shell rock and sandy grounds. Spawning from March to August. Males guard eggs. Feeding on small zoobenthos and small fish. Ponto-Caspian invader.	++	Commercially unimportant., however, increase of abundance is recorded.

24	Black goby - *Gobius niger* Linnaeus, 1758	Up to 18 cm in length. Spawning from May to August. The species is able to sustain significant desalination of the water. Feeding on zoobenthos.	+	Commercially unimportant.
25	Bullrout - *Myoxocephalus scorpius* (Linnaeus, 1758)	Up to 60 cm in length. Inhabits the near-shore zone. Prefers stony grounds. Spawning in December-January. Predator.	+	Commercially unimportant.
26	Four-horn sculpin - *Myoxocephalus quadricornis* (Linnaeus, 1758)	Up to 37 cm in length. Inhabits the near-shore zone of the sea. Spawning in autumn and winter. Feeding on zoobenthos and more seldom on small fish.	+	Commercially unimportant.
27	Lumpfish - *Cyclopterus lumpus* Linnaeus, 1758	Up to 50 cm in length. During spawning (May-June) migrates to shallow areas. An euryphagous species.	+	Commercially unimportant.
28	Sea snail - *Liparis liparis* (Linnaeus, 1766)	The usual length from 10 to15 cm. Prefers stony grounds. Spawning in December-February. An euryphagous species.	+	Commercially unimportant.
29	Three-spined stickleback- *Gasterosteus aculeatus* Linnaeus, 1758	Usually 4-12 cm in length. Maturity at 2 году. Spawning from April to June. Constructs a nest, where a male guards eggs and larvae. An euryphagous species.	++	Commercially unimportant. The state of the stock is satisfactory.
30	Worm pipefish - *Nerophis ophidion* (Linnaeus, 1758)	Up to 29 cm in length. Spawning in August. Fish carries eggs in a brood chamber. Plankton-eater.	+	Commercially unimportant. The species is poorly researched.
31	Flounder - *Platichthys flesus* (Linnaeus, 1758)	Up to 50 cm in length. Spawning in February-April. Pelagic eggs. Young fish migrate into the coastal zone and stay there for the entire summer. An euryphagous species.	+++	Commercial species. The state of the stock is satisfactory.
32	Plaice - *Pleuronectes platessa* Linnaeus, 1758	Up to 90 cm in length, usually from 30 to 40 cm. Spawning in February-May. Pelagic eggs. An euryphagous species.	+	Commercial species, however, occurs rarely in the Curonian Spit area.
33	Dab - *Limanda limanda* (Linnaeus, 1758)	Up to 40 cm in length. Inhabits sandy grounds. Spawning in May-August. Pelagic eggs. An euryphagous species.	+	Commercially unimportant. Very rare species.
34	Turbot - *Scophthalmus maximus* (Linnaeus, 1758)	Up to 55 cm in length. Inhabits sandy and silt grounds. Spawning in May-July. Pelagic eggs. Prior to the spawning the species migrates to the shore, where sex products are maturating in the warm water. Further, a female accompanied by several males migrates off the shore and spawns over the depths from 60 to 100 m. Pelagic eggs. In July young fish migrate to the shore for feeding.	++	Important commercial species. The state of the stock is unsatisfactory.

Appendix 2. Draft Regulations on the protected zone of the Curonian Spit National Park from the side of the Baltic Sea

APPROVED
by the Order of the Ministry
of Natural Resources and Ecology
of the Russian Federation
of ___ _____ 201__ №_____

REGULATIONS ON THE PROTECTED ZONE OF THE

CURONIAN SPIT NATIONAL PARK

I. General provisions

1.1. The Regulations have been elaborated in compliance with the requirements of the Federal Law № 33-FZ of 14 March 1995 «On the Specially Protected Natural Territories».

1.2. The protected zone of the Curonian Spit National Park (hereinafter "the protected zone") is created under the Decree of the Ministry of Natural Resources and Ecology of the Russian Federation No._____of ___ _____201_ in the 12-mile zone of the internal sea waters and territorial waters of the Russian Federation adjacent to the western coast of the Curonian Spit.

1.3. The boundaries of the protected zone are fixed in the coordinates system WGS-84 and are presented in the Appendix 1 to the Regulations. The map of the protected zone of the National Park is presented in the Appendix 2 to the Regulations.

1.4. The protected zone has been created for the purpose of protection of the unique natural complexes of the Curonian Spit against any unfavorable anthropogenic impact, conservation of the typical near-shore communities of the South-West Baltic Sea, spawning and feeding grounds of young commercial fishes and protection of of marine mammals and birds during migration and reproduction periods.

1.5. The aquatic areas within the protected zone used by owners, landholders, land users, leaseholders, servitude holders will not be withdrawn. The use of aquatic areas and natural resources is carried out in compliance with the laws of the Russian Federation observing the regime determined in the Regulations.

1.6. The boundaries and regime of the protected zone should be taken into consideration in elaboration of plans and prospects of the economical and social development, preparation of documents for the territorial planning. The information on the protected zone boundaries should be entered into the documents of the State Cadastre of Real Estate according to the adopted procedure.

1.7. The Federal State Budgetary Institution "Curonian Spit National Park" (hereinafter "Institution") implements the following functions within the protected zone:

* protection of the natural complexes and objects aimed at conservation of biological and landscape diversity;

* state supervision over protection and use of the specially protected natural territories;

* fulfillment of scientific-research tasks;

* ecological monitoring

* ecological-educational activities and development of cognitive tourism;

* realization of other functions in compliance with the present Regulations and the laws of the Russian Federation.

II. Regime of the protected zone

Within the protected zone boundaries the following activities are prohibited:

1) bottom-dredging, explosive and drilling works;

2) exploration and mining of mineral resources;

3) laying pipes and other communications, except for those necessary for the National Park and its inhabitants vital activities;

4) activities related to disposal (storage and burial) and utilization of industrial, municipal wastes, radioactive, chemical, explosive, toxic substances and poisons;

5) discharge of oil products (including wastes) from vessels and other sailing craft;

6) discharge of hazardous substances, industrial and municipal wastes, oily, household and faecal sewage from vessels, other sailing craft, aircraft;

7) intentional introduction of alive organisms for the purpose of their acclimatization;

8) actions resulting in disturbance and frightening away marine mammals and birds, as well as attracting and feeding them;

9) commercial, sports and recreational hunting;

10) catching all species of aquatic biological resources with any trawl fishing gears during the entire year, and during the period from 1 June to 31 July fishing with any fishing gears is prohibited in compliance with the Fishing Rules for the West Fishery Basin, approved by the Order of Rosrybolovstvo No. 393 of 10.12.2008 with subsequent amendments and supplements;

11) movement of any motor sailing craft within the 5-m isobath (400 m from the shore-line), except for the craft of the governmental organizations implementing public ecological control and supervision, guarding the state border, maintaining the law and order, preventing and liquidating emergency cases and rescuing people (Inspection Board for the National Park territory guarding, Border Department of FSB of Russia, police, Fishery Supervising Board of Russia “Rosrybnadzor”, Emergency Service, etc.), as well as the sailing craft of persons having licenses for commercial fishing activities.

Within the protected zone boundaries the following activities are allowed:

1) commercial fisheries within the areas allocated in compliance with the Fishing Rules for the West Fishery Basin and the present Regulations;

2) recreational and sports fisheries from the shore and from the water in compliance with the Fishing Rules for the West Fishery Basin and the Regulations;

3) fishery melioration without introduction of alive organisms;

4) protection and recovery of the Spit shores, approved by the ecological experts examination;

5) recreational usage of the aquatic areas (swimming, recreational fishery, diving, kiting, yachting, etc.), including construction of required berths and beach equipment;

6) fulfillment of ecological monitoring, nature protection and biotechnical measures, scientific research and ecological educational activities;

7) other kinds of activities implemented in compliance with the acting ecological legislation and without any damage for the nature complexes and objects of the National Park.

2.3. Taking into account the requirements of the recreational fishery and tourism, the transport corridors of 300 m in width will be provided for motor sailing craft entering outside the 5-m isobath near s. Lesnoy, Rybachiy and Morskoye.

2.4. Taking into consideration availability of especially valuable and especially vulnerable ecosystems, the specially protected locations will be determined within the protected zone, where fishing and mass recreational activities are totally prohibited. Only scientific, educational and ecological-informational usage of these locations will be allowed.

The specially protected locations are fixed in the areas restricted with the lines passing perpendicularly to the shore-line and situated between 14th and 16th km, 23rd and 28th km, 38th and 49th km (up to the Lithuanian border) of the Curonian Spit, except for the beach zone near s. Morskoye.

2.5. The time, methods and means of scientific-research activities planned by fishery, scientific and other organizations should be coordinated with the Institution.

2.6. In the protected zone territory any shooting and catching the fauna representatives for scientific purposes should be coordinated with the Institution.

2.7. The persons having licenses for commercial fishery, issued in compliance with the adopted procedure, should coordinate in the written form with the Institution the time (periods), locations, amount of catch, fishing gears and methods of fishing the aquatic biological resources in the protected zone of the National Park.

2.8. The boundaries of the protected zone will be indicated in maps. The information on restriction of navigation in the internal sea waters and territorial waters of the Russian Federation, included into the protected zone, will be published in the “Notifications for Navigators”.

2.9. Individuals and legal entities guilty of breaching the adopted regime or any other rules of protection and usage of the environment and natural resources within the protected zone, should be punished in compliance with the procedure set by the law.

III. State supervision over the protection and use of the protected zone territory (aquatic areas)

3.1. Within the protected zone the state supervision over the protection and use of the territory (aquatic areas) of the protected zone is implemented by the officials of the Institution in the person of state inspectors of the National Park territory protection, as well as by means of joint raiding together with fishery inspectors of the West-Baltic Territorial Department of Federal Agency for Fisheries, representatives of police, Border Department of FSB of the Russian Federation for Kaliningrad region and other executive authorities and public fishery inspectors.

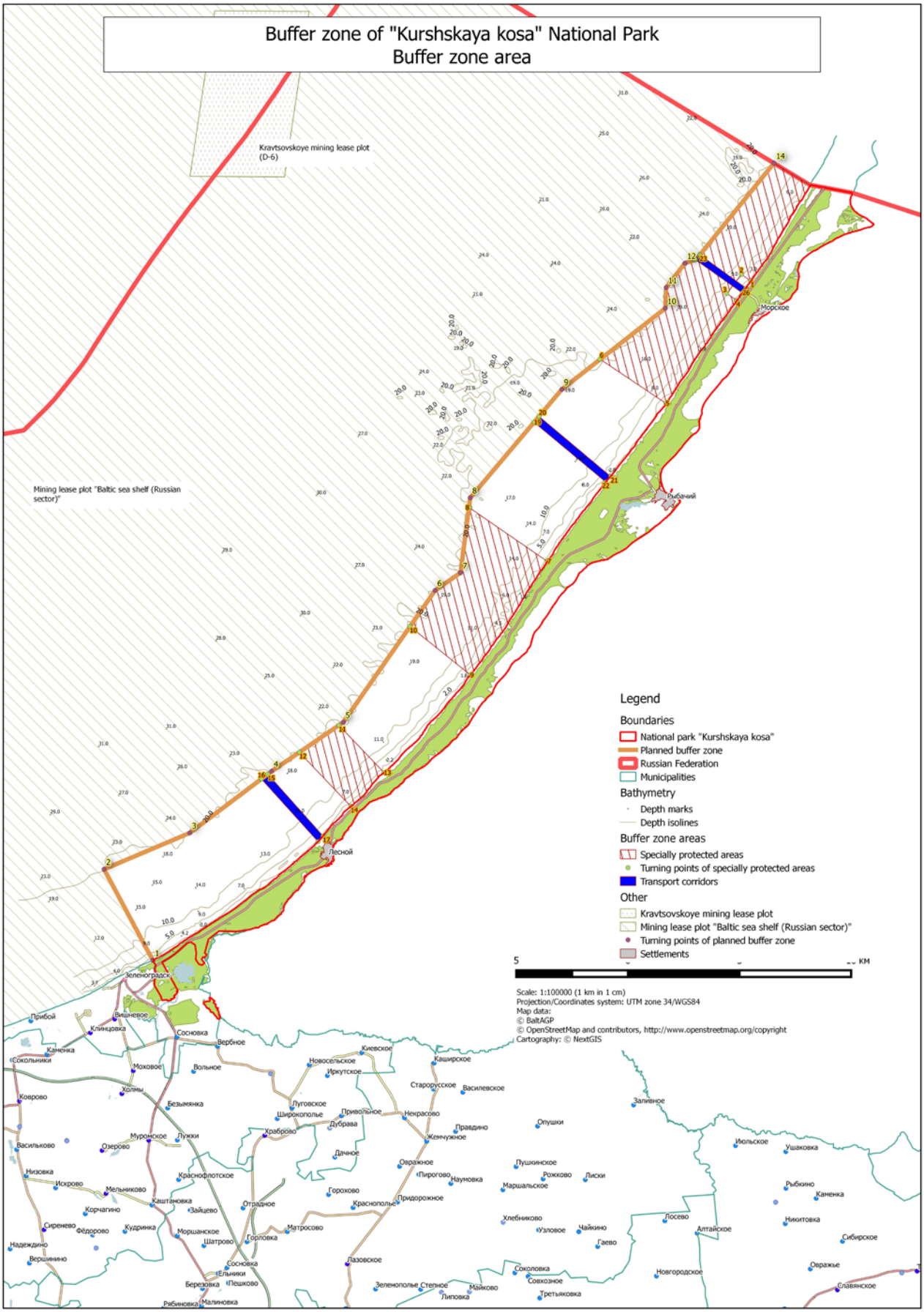
Appendix 1
to the Regulations on the Protected Zone of the
Curonian Spit National Park

Description of the boundaries of the protected zone of the Curonian Spit National Park

The geographic coordinates of the turning reference points of the protected zone boundaries in the National Park are fixed in the coordinate system WGS-84.

The boundary of the protected zone begins at the point, where the southern boundary of the square 77 of Zelenogradsk district forestry of the Curonian Spit National Park crosses the shore-line of the Baltic Sea (point 1 at 54°58'4.05"N, 20°29'39.98"E) up to the crossing the state border of the Republic of Lithuania.

Appendix 3. Territory of the protected zone of the Curonian Spit National Park. Territory of the protected zone.



Appendix 4. Territory of the protected zone of the Curonian Spit National Park. Valuable natural objects.