

**UNESCO –
World Heritage
Nomination**

Curonian Spit

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1. Identification of the property

- b) **Country** – the Curonian Spit is situated on the border of two countries – Lithuania and Russia
- c) **State, Province or Region** – Lithuania: Klaipėda region: Neringa and Klaipėda municipalities.
Russia: Kaliningrad Region, Zelenogradsk District;
- d) **Name of the Property**– "Curonian Spit";
- e) **Exact Location on a Map and the Geographical Coordinates** – "Curonian Spit" lays within the following geographic coordinates: 55°43'27 - 54°57'24 North latitude and 20°31'36 - 21°05'43 East longitude; (see map 2)
- f) **Maps and Plans** (see attachment 1)
1. Location of the Curonian Spit on the map of Europe
 2. Physical geographical map of the Curonian spit
 3. Zones of the Curonian Spit
 4. Endangered and threatened species of the Curonian Spit
 5. Cultural and natural values of the Curonian Spit;

g) **Area of the Property and of its Buffer Zone**

Total area, comprising:	33 021 ha
Land surface	16 321 ha
The Curonian Lagoon (Kuršių Marios) aquatory	4 200 ha
The Baltic Sea aquatory	12 500 ha

Buffer zone: on the Russian part - aquatory of the Baltic Sea and of the Curonian Lagoon within 1 km from the cost line (see map 3).

2. Justification for Inscription of the Nomination into the List

a) Statement of Significance

Natural significance

Curonian Spit is one of the largest accumulative forms of the Baltic relief. Its unique and inimitable significance is conditioned mainly by the position and relief:

- Due to its geographical position and orientation (Northeast to Southwest) it serves as a "directing line" for the different birds' migrations and connects the North-Eastern part of Russia, Finland and Eastern Baltic countries with the Central and Southern Europe. The Curonian lagoon shore is surrounded by reeds and rushy places, which provide refuge for the waterfowl. The main species of birds using the lagoon are ducks, grebes, coots, gulls, and little terns, a lot of birds use the region as a staging area in spring and fall. The territory was recognised an important area for migratory waterfowl - along the seashore through the Curonian Spit stretches the **East Atlantic Fly Way**. Rossitten Ornithological station, the first ornithological station in the World, has been working (birds are tagged) on the Curonian Spit since 1901;
- The dune complexes are the main relief elements. They are among the highest in Europe and are especially picturesque and attractive.
- Sandy beaches, the Baltic sea coastal dune ridge, and great dune ridge provide for natural and seminatural habitats to threatened species of animals and plants; the old forest habitats are of outstanding universal value from the scientific and conservational viewpoint;

- Relatively “young” age of the spit determines its peculiarity and its high scientific significance conditioned by unfinished and still ongoing processes of its biostructure formation.

Cultural significance

- The Curonian Spit landscape is being created not only by natural processes but also by human activities and represents the combined work of nature and that of a man. It illustrates the evolution of fisherman society and settlements over the time. Until now the Curonian Spit presents a continuing cultural landscape, which retains an active social role in contemporary society associated with the traditional way of life and in which the evolutionary process is still in progress. At the same time, it exhibits significant material evidence of its evolution over the time, the latter integrally related to both natural forces and human activity. At the Curonian Spit one could still observe the relict (or fossil) landscape in which an evolutionary process came to an end in the past - the tribe Kursiai, which have settled on the Curonian Spit for a long time disappeared, but their ethnographic heritage still exists, as well as the former landscape of fishermen villages can be found under the sand, sandy dunes - 13 villages were covered by sand after cutting forests on the Curonian Spit.

The Spit retains the following cultural heritage items:

- sites (fishermen settlements): where works of man and nature are of outstanding universal value from the ethnocultural, historic and aesthetic viewpoint;
- monuments: architectural works, protective structures unique in their scale, which are of outstanding value from the point of view of history, art and science;
- archaeological sites, first of all, buried villages .

Special and unique significance of the Curonian Spit is expressed through vivid combination of its natural and cultural legacy. The latter is a reference not limited to material and spiritual results, but including the experience accumulated by generations of local people, which allowed for rehabilitation of previously lost natural systems of the spit and their present existence.

In this context the Curonian Spit appears as an excellent picture illustrating examples of harmonious interaction between men of the present generations and their natural environment.

b) Comparative Analysis

No more than five other spits comparable in size and other parameters to the Curonian Spit exist in the World. The Curonian Spit has no analogues among other objects of the Baltic Region and Northern Europe because of its unique orographic parameters, geomorphological characteristics and geological composition, as well as climatic peculiarity of its territory, mosaic of its landscapes and concentration of numerous species of fauna and flora on its fairly small grounds. The length of the Baltic (Visla) Spit, the closest one to the Curonian, is twice shorter than that of the Curonian. The same ratio is true for dune height comparison (35 and 68 m respectively). Another spit named Merzuezha Helska (Poland) in turn is considerably smaller in parameters than the Baltic Spit.

In the relief of the dune complexes here one can see more clearly than in the other places (Vistula Spit and other spits) zones altering in the direction of sea-gulf: beach, protective beach dune bank (avandune), coastal dune ridge, front dune deflation-accumulation plain (palve), dune massifs, near coastal palve, beach on the lagoon side. That is the reason for the differentiation of the vegetation and animals and of all the natural complexes.

The differentiation of the habitats also determined the fact, that Curonian Spit appears to be a proving ground for the tree-like plants introduction in the Baltic region. Many of those plants (more than 90 species) have become natural to the area. Here one can observe one of the highest densities of bird migration flows in spring and fall periods. At the same time the Curonian Spit represents both main groups of organisms and the ecosystems of the sandy spits of

the whole Baltic Region.

c) Authenticity / Integrity

The Curonian Spit represents a united natural complex, which main components (forested and migrating dunes, plain and marshy forests, sea coasts) are uninterruptedly connected with each other due to their common origin, history and dynamics of their natural development. The distinctive special feature of the Spit is its extraordinary diversity and contrasts of the natural communities that exist in the immediate neighbourhood: beaches, upper and lower marshes, salty and freshwater water bodies, meadows, pine, broadleaved, black-alder woods, birch and willow rare forests, sandy dunes that cause an extreme diversity of the animal and vegetable kingdoms on a restricted area. Presently the natural processes of landscape development are still continuing on the Spit, amplified by human activity. The whole complex of the interconnected natural elements of the Spit and the whole landscape profile from the Baltic Sea shore to the shallow waters of the Curonian Lagoon, as well as adjoined water areas, is preserved in the National Park and its buffer zone. The Curonian Spit with its relatively small area (16 thousand ha) can ensure the conservation and further natural development of a representative complex of landscapes that characterise all the spits as well as all the Baltic Sea coast.

The boundaries of the natural park are entirely coincident with the natural limits of the Spit ecosystem. The latter circumstance along with presence of water body around it allows for legal integrity of the Curonian Spit and preservation of its natural and cultural valuable objects.

d) Criteria under which inscription is proposed

The Curonian Spit is nominated on the basis of the following criteria:

- **N (i) Unique Example, characterising the last Stage of the Earth Evolution with the High Dynamic of Geological and Geomorphological Processes;**

The Curonian Spit is the largest form of accumulative relief in the Baltic Sea. It presents a classical example of Quaternary period of Holocene epoch representing different stages of the Baltic Sea forming process, where geomorphic shapes and traits are still undergoing development. Its formation is related to the middle part of the Holocene, when due to the active throw of the alluviums from the seabed to the shore the huge bars were formed and afterwards transformed by along-the-shore alluvium flows. The unique dune landscape was formed later due to the wind activity. The linear dunes (among the highest in the Northern Europe – till 60 and more meters) predominate. They extend as a range over 70 km long and 0,3-1 km wide along the peninsula (photos 5 - 8).

- **N (iv) Contains the Natural Habitats, the most important and considerable for the Conservation of Biodiversity, including the Species with the Universal Value from the Scientific and Conservation Point of View;**

Due to its geographical position and its orientation from the North-east to the South-west the Curonian Spit serves as a “directing line” for the migrating birds of many species and connects the North-east of Russia, Finland and countries of Eastern Baltic Region with the Middle and Southern Europe. NP represents an extremely high density of the birds migration flow in spring and fall periods. Annually during spring and fall from 10 to 20 million migrating birds fly over this 1 km wide strip of land. The considerable part of them stops for rest and breeding. Among the passing migratory birds there are a lot of rare and threatened species, included into the Red Books of Russia, Europe and the World, including *Cygnus bewickii*, *Anser erythropus*, *Branta bernicla*, *Pandion haliaetus*, *Aquila clanga*, *Aquila chrysaetos*, *Haliaeetus albicilla*, *Falco peregrinus*, *Gallinago media*, *Numenius arquata* and others. Since birds of passage concentrate in these large quantities only on the Curonian Spit, it is the most important link in the chain of the natural protected territories on the route of the White-Sea-Baltic migration way. The largest Research Centre of the Russian Academy of Sciences studying biology,

behaviour and migration of birds is situated here.

296 species of ground vertebrates exist on the Curonian Spit. Density of hoofed animals' population is rather high. 33 fish species inhabit the waters of the Curonian Lagoon.

The existence of different phytocenoses on a small territory, including the open and free of vegetation sandy spaces, allow to study their development and formation in the process of overgrowth. The sea-side dune ecosystems typical for the Baltic and the Curonian Lagoon shores are the natural biotopes for some endemic species of the Baltic shore (*Linaria loseli*, *Cakile baltica*, *Tragopogon heterospermus*, *Anthyllus maritima*, *Eringium maritimum*) and other sand-loving species that are not found in other phytocenoses inside the continent. In the root of the Spit one of the largest population of *Lunaria redeviva* in the region exists. It is included into the Red Book of the USSR. Some species of the *Orchidaceae* family and several relic and protected species (*Ophioglossum vulgatum*, *Botrychium simplex* (at the border of its habituat area), *Hippurus vulgaris*) are noted here. *Euonymus verrucosa Scop*, *Sarothamnus scoparius*, *Hedera helix*, *Rubus chamaemorus* (see map 4 and attachments 4.1 and 4.2) grow here marking the edge of the area of their distribution.

The flora of the NP accounts for about 632 vascular plant species, which constitute part of natural and artificial forest plantations, coastal dune complexes and small-leaved forest associations.

- **N (iii) Contains the Landscapes of Exceptional Beauty and Aesthetic Importance;**

The diverse and highly differentiated dune relief of the Curonian Spit in combination with the forest greenery along with the variegated meadows of blooming grasses and boundless expanses of the Baltic Sea, that throw its foaming waves on the sandy beaches, is of great landscape value. The Curonian Spit represents unique masterpieces of nature, that are hardly comparable with anything in the Baltic Region and Northern Europe in terms of their beauty and picturesque scenery (photos 1,2).

There is a whole set of aesthetically valuable elements: overgrown dunes and unattached sandy dunes blown with the wind (with the height up to 60 m), musical noise produced by friction of sand grains in the wind, sandy beaches, woods and meadows alternating on a small area, bolls of *Gypsophila paniculata* blown by breeze, a lot of birds, etc.

Created by the sea and heavily influenced by the continent, sea and wind, the Curonian Spit really is a unique natural creation. On this narrow strip of land in the middle of the sea (the width of the spit fluctuates from 0,4 till 3,8 km) the largely diverse landscapes are connected into a profile that changes from nearly tundra to desert, reminding the Karakum sands. The open sandy dunes arising up to 40-60 m against the blue mirror-like surface of the Curonian Lagoon on the one side and the storming Baltic Sea on the other side could astonish any visitor of this wonderful natural corner with its inimitable beauty (see map 5).

- **N (ii) Exhibits outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;**

The Spit, thanks to its divided relief and microrelief and the microclimatic peculiarities represents an extreme diversity of ecosystems on a small area, ranging from upper and coastal marshes, spruce, pine, broad-leaved and small-leaved forests to steppe and sandy desert.

Long time of struggle with the moving sands made the Spit a unique testing ground for the introduction of tree and bush species from the North America, Far East and the Central and Southern Europe (photos 3,4,9,10).

- The Curonian Spit fulfils the following criteria if the World Cultural Heritage area:
- **C (ii) is an outstanding continuing landscape, which retains an active social role in contemporary society closely associated with the traditional way of life, and in which the evolutionary process is still in progress. At the same time it exhibits significant material evidence of its evolution over the time ((see p. 3 b) History and Development);**
 - **C (iv) is an outstanding example of a type of building and landscape which illustrates a significant stage in human (fishermen) history;**
 - **C (v) is an outstanding example of a traditional layout of human settlements, as well as land - use which is representative of a culture becoming vulnerable under the impact of irreversible changes.**

3. Description

a) Description of the Property

The Curonian Spit is a sandy peninsular separating the Baltic Sea and the Curonian Lagoon. It stretches as a narrow (ranging from 0.4 to 3.8 km in width) slightly concave arc for 98 km (52 km in Lithuania) from the Peninsular of Kaliningrad to the city of Klaipėda.

On the basis of the administrative-territorial division, the Southern part of the Curonian Spit is related to the Kaliningrad Region of RF, and the Northern – to Lithuania. National Park “Kurshskaja Kosa” exists on the Russian territory from the 1987. On the Lithuanian part the National Park “Kuršių Nerija” was established in 1991.

Northern boundary of the Spit is the Strait of Klaipėda, in the south the Spit borders with the lands belonging to the town of Zelenogradsk, part of Kalinigrad district. The largest settlements in the Lithuanian part are Smiltyne, Pervalka, Juodkrantė, Preila and Nida; on the Russian side these are the settlements of Lesnoje, Morskoje, Rybachy and tourist hotel “Diuny”.

Administrative centre of the Lithuanian part of the Park is located in the city of Klaipėda, the Russian administrative offices are in the settlement of Rybachy. In the middle part of the Spit there is an automobile road with hard surfacing connecting Klaipėda and Zelenogradsk by ferry. The distance from the Region centre (Kaliningrad) equals to 75 km, from “Khrabrovo” airport it is about 55 km and about 35 km from the nearest railway station.

Natural - Territorial Division of the Curonian Spit

In the classification of natural landscapes of the Southeast coast of the Baltic Sea the Curonian Spit is defined as a distinct type of eolian coastal-sea landscape.

The most important value of the Curonian Spit is its unique and sensitive landscape created by interaction of sea, wind and human activity. The main features are as follows: great dune ridge with an old parabolic dunes in Juodkrantė, grey (dead) dunes in Agila-Nagliai segment, moving dunes in Parnidis segment, the sand covered layers of old soils, as well as the blown sand plains, coastal dune ridge, specific vegetation and fauna. Important authentic cultural values include the following: ethnographic buildings of fishermen, old villas, cultural layers of old settlements covered by sand, memorial sites.

The relief forms resulted from the sea and wind activities. The unattached dunes of the Curonian Spit are moving progressively and in some sectors shift towards the lagoon with the speed of 4 m per year. Such dune movement towards the lagoon over a long period of time has caused formation of accumulative ledges stretching out far into the Lagoon. This also was the reason why the Western shore of the Curonian Lagoon became shallow.

Land cover structure of the Curonian Spit:

Total area of the Curonian Spit	16321 ha	100%
• Forests	11640 ha	71.3%
• Sandy areas	4097 ha	25.1%
• Mires	41 ha	0.25%
• Meadows and pastures	40 ha	0.25%
• Inland water bodies	40 ha	0.25%
• Agricultural lands	6 ha	0.04%
• Roads	125 ha	0.77%
• Built up areas	332 ha	2.03%

There are the following latitudinal belts of landscape types (west to east):

- marine coastline (beach and foredune ridge);
- blown sand plain (Lith. - *palvė*) with undulating relief which is overgrown either with forests or with grasses;
- blown-out dunes where the remains of the old dunes occur;
- great dune ridge (segments and forms of dunes are diverse);
- plain (*palvė*) at the lagoon coast (in some places it doesn't exist);
- the lagoon shore.

All the belts stretch from the beginning to the very end of the Curonian Spit, with the exception of blown-out remnants area, and they vary in width.

Geomorphological features

Without any doubt, the dominating element of relief is represented by a large high-dune ridge, which stretches for about 72 km and is from 250 m up to 1.2 km wide. The average height of this ridge makes 35 m, however, some dunes exceed 60 m in height. In some places the windward side of the ridge is steeply sloping down to the lagoon. The dune valleys divide the ridge into separate dune massifs, and as a rule, in front of these dune valleys the capes are formed. At present over a half of the considered ridge is covered with forests.

The parabolic dunes represent a complex morphological system of linked and partly superposed eolian forms. The front of the massifs of parabolic dunes retains a cusped character.

Geologic structure of the Spit is made up by eolian, marine and water-glacial Quaternary deposits of the contemporary and upper sections. The eolian complex composes the avant-dune, the upper layer of *palvė* and the thick layer of the dune massifs. Beneath it there is the sea generation of sands with the stringers of loam, peat, silt and so on, that are underlain by moraine and inter-moraine loam of the Valdai Glaciation. The Quaternary complex includes 3 aquifers. The uppermost is represented by ground waters contained in the eolian and upper part of marine sediments. The depth of their occurrence correlates with the relief and under the dunes constitutes dozens of meters. Under the avant-dune it is about 10-15 m and in *palvė* it is around 0-3 m. The soils of the Spit are very young and that is conditioned by relatively recent formation of the area and ongoing eolian processes. About 15 % of the spit area are characterised by excessively humid soils with sharp differences in humidification between seasons and years.

Hydrography

From the outside the Spit is washed by the Baltic Sea, from the interior side by the Curonian Lagoon. Hydrography network is represented by temporary brooks and lakes. The largest lake is Tchaika in the region of Rybachy settlement.

During the warm period of the year the sea water temperature does not differ much from the ambient air temperature. The ice regime is described by high instability. During mild winters the ice does not form or appear near the shore for several days only.

The Curonian Lagoon is a shallow lagoon, connected with the sea by the narrow Klaipėda

Strait. The depths along the shore are shallow. The average annual water temperature is +5 degrees C, in the warm period it is about +20 degrees and in some years it reaches +25 - +27 degrees C. The average perennial level of the lagoon is 12 centimetres higher than the level of the Baltic Sea. The lagoon is half-freshwater: the salt content is about 1-3% in winter and in summer – less than 0,5% (in the Baltic Sea it is about 7%). In winter the thickness of ice-cover is up to 65 centimetres.

Climate

The climate in the Curonian Spit is an intermediate between marine and continental and is characterised by frequent and intensive changeability of weather, by mild winter and moderately warm summer. The average annual air temperature is +7.0 degrees C, with the absolute minimum of -26 degrees (January) and the absolute maximum of +31 degrees C (June). The average annual precipitation is 660 mm, the maximum falls on the period from October till February. The height of the snow cover is up to 15-20 centimetres.

Over the course of a year 30 to 40 days with wind speed exceeding 15 m per second are noted. It influences the sand movements and causes a phenomenon called “drunk forest”, especially on the windward slopes and on the coastal line (photo 10). The specific arrangement of the territory determines the two-way breeze circulation in summer. That is why the reiteration of sunny weather is higher there than on the continental part. Also due to the influence of the heated high forested dunes in summer one can observe there noticeably fewer days with strong winds on the Spit, the air temperatures are higher and the relative humidity is lower as well.

Biodiversity

The biodiversity on the Curonian Spit is caused not only by relief forms and meridional elongation, but also by the soil type. Two types of soil prevail: sandy (both dry and wet) and the peat soil. There is no soil cover on moving dunes. Currently forests cover about 70% of the Spit area, these are mostly pine forests. Natural or seminatural or planted forest habitats cover the Curonian Spit.

Formation of pine and spruce forests, oak and alder woods constitute the indigenous vegetation of the Spit. Among 11547 ha of the lands covered with the forest vegetation, there are 8322 ha of pines, 207 ha of spruce, 1719 ha of birch, 832 ha of alder. 7065 ha are represented by artificial plantings (mainly pine cultures). The large areas are covered with the cultures of elder ages, which do not practically differ from the natural saplings of a green-moss type.

The oldest pine-spruce forests are situated on the Southern part of the Spit; small spots of horn beam-linden forests near Rybachy settlement represent the broad-leaved woods. On the dune ranges consisting of almost bare quicksand the vegetation is hardly developed.

The main forest creating species are **pin**es: *Pinus sylvestris* L. – the aborigine species; *Pinus mugo* Turra, *Pinus pallasiana* D. Don, *Pinus banksiana* Lamb. – introducents, and **spruce** – *Picea abies* (L.) Karst.; *Picea glauca* (Moench) Voss and *Picea sitchensis* (introducents). **Desiduous species** are *Betula pendula* Roth. and *Betula pubescens* Ehrh., *Alnus glutinosa* (L.) Gaertn and *Alnus incana* (L.) Moench., *Populus tremula* L.; less abundant – *Acer platanoides* L., *Quercus robur* L., *Tilia cordata* Mill. The **shrubs** are represented by more than 20 species; there are not many **undershrubs**: *Vaccinium myrtillus* L., *Vaccinium vitis-idaea* L., *Calluna vulgaris* (L.) Hull., *Empetrum nigrum* L.

In the **grass cover** of the forests and openings there are about 200 species of plants with different systematic membership and from different ecological groups (xerophytes, mezophytes, hygrophytes, etc.).

The meadow cenoses are associated with the lagoon coast and are less expressed on the palve. The meadow flora accounts for nearly 100 species with predomination of cereals and sedges.

Aquatic vegetation (lagoon) has a belt-like pattern: a belt of reeds (*Phragmites australis* (Cav.) Trin. ex Steud.) followed by a belt of bulrush (*Scirpus lacustris* L.), a belt of water-lilies (*Nymphaea candida* J. Presl, *Nuphar lutea* (L.) Smith), a belt of clasping-leaved pondgrass

Potamogetonaceae (*Potamogeton perfoliatus* L., *P. compressus* L., *P. pectinatus* L.); further in the direction away from the coast there are belts of macro- and microphytes, represented by real seaweeds.

Of interest are specific *Psammophylea* communities on the dunes and protective bank on the shore (avant-dune). *Honckenya peploides* (L.) Ehrh.) is noted in the flora of the protective bank (avant-dune). It is practically absent on the dunes of the Curonian Lagoon side.

As a matter of fact, the Curonian Spit is a proving ground for introduction of species, where more than 60 species of wood plants stand the test for survival and stability for more than one hundred years. The most stable of them are included in the selection used for practical purposes: *Pinus mugo* Turra, *Pinus banksiana* Lamb., *Pinus pallasiana* D. Don, *Picea glauca* (Moench) Voss., *Padus serotina*, *Robinia pseudoacacia*; *Larix leptolepis* Gord., *Picea sitchensis*, *Pinus rigida* Mill represent a significant interest. Experience of cultivation of the latter on the Spit requires further investigation.

Forest phytocenoses.

Data on the Curonian Spit forests:

Total area covered by forests	11203 ha
Pine forests:	8324 ha (74,3%)
• <i>pinus silvestris</i>	6018 ha (53,7%)
• <i>pinus montana</i>	2226 ha (19,9%)
• <i>other pinus</i>	80 ha (0,7%)
Birch groves	1702 ha (15,2%)
Alder groves	845 ha (7,5%)
Spruce groves	220 ha (2%)
Other	112 ha (1%)

The Spit forests can be divided into 4 groups according to the age:

- 1) the eldest forests (mainly pine-spruce with the age of more than 100 years);
- 2) plantings of mountain pine, Banks pine and Canadian spruce, as well as of local species (common pine and others) with the age of 50-70 (90) years;
- 3) young plantings of mountain pine and willow (various species) – 35-40 years;
- 4) plantings of mountain pine, common pine and willow in the age of 20-25 years.

Phytocenotic characteristics of the Curonian Spit forests is as follows: **depressions in the relief are occupied by black alder forests**; the underwood consists of *Frangula alnus* Mill., *Prunus padus* L., *Euonymus europaea* L., *Viburnum opulus* L., *Rosa canina* L.; in the grass cover there exist *Oxalis acetosella* L., ferns (*Athyrium filix-femina* (L.) Roth, *Dryopteris dilatata* (Hoffm.) A. Gray, *D. carthusiana* (Vill.) H.P. Fuchs), *Melandrium dioicum* (L.) Coss.&Germ., etc. The species composition of the grass layer is determined by the underground water level. In the black alder forest (with admixture of ash-tree and maple) near Zelenogradsk rare species are found: *Lunaria rediviva* L., *Listera ovata* (L.) R. Br.; among shrubs -- *Daphne mezereum* L.. Alder forests cover 845 ha.

The **birch forests** occupy the area of 1702 ha (*Betula pendula* Roth, *Betula pubescens* Ehrh., hybrid among them). The birch plays considerable role in the composition of the forest cenoses of the Spit; mixed (pine-birch, birch-spruce) and pure birch forests are represented there. Underwood in these forests is not developed; more often *Sambucus nigra* L., wild roses (*Rosa canina* L., *R. majalis* Herrm) are found in underwoods. Birch mixed with black alder often grow in the depressions of relief. The grass layer of the birch forests is extremely diverse.

The largest areas (**more than 70 per cent**) are covered with **pine forests** (6018 ha - *Pinus sylvestris* L., 2226 - *Pinus mugo*, 22 - *Pinus banksiana*, 29 - *Pinus nigra*, 24 - *Pinus pallasiana*, 10 - *Pinus murrayana*.). Pine forests of an elder age are the real green moss forests.

Linkage of crowns (0,8-0,9) is the highest in these forests and grass cover is weakly developed, *Melampyrum pratense* L. usually predominates.

In the high-stand pine forests of better drained areas the moss and grass covers are poorly developed; *Pyrola chlorantha* Sw. and *Monescens uniflora* (L.) A. Gray grow in sporadic spots; *Goodyera repens* (L.) R. Br is encountered less frequently. Thinned out pine forests dominated by *Deschampsia Beauv* are present there as well.

Forest cultures of the introduced pine species cover small areas. Not many spruce forests have been preserved on the Spit: being liable to wind falls the spruce was damaged a lot during the hurricanes of 1967 and 1981.

As was shown above, among the **introduced ligneous species** *Pinus mugo* Turra is the most widely spread on the Spit. The mountain pine plantings are developed both on the flat plain (palve) and on the dune ridges. Cenosises formed by mountain pine differ considerably depending on different environmental conditions. Dense bushes form the impassable thickets; they serve as good refuges for hoofed animals, hares and birds (photos 3,4).

Canadian spruce (*Picea glauca* (Moench) Voss) forms small plantings with abundant young trees; the underwood there is absent and the grass cover is either green-moss-*Oxadlidaceae*, or green-moss-*Deschampsia*.

The plantings of *Pinus pallasiana* D. Don are also small in area. These plantings are younger (20-25 years) with thickly growing stand, with thickly joined crowns. The soil cover consists of fallen pine needles (dead cover).

The area covered by dense **willows** (*Salix caprea* L., *Salix repens* L., *Salix daphnoides* Vill. And others) makes about **20 ha**. Willows are usually distributed through cultural plantings; wattle-fences used during the sand-fixing works on dunes and on the coastal bank are also the sources of willow spreading on the Spit.

Meadow, marshy and psammophilea phytocenosises.

The plant groups of non-forest type are of subordinate importance on the Spit. The upper marsh near the Spit foot is rather interesting (three species of sphagnum, *Drosera rotundifolia* L., at the edges there are *Rubus chamaemorus* L., *Ledum palustre* L., *Andromeda polifolia* L., small spots of cranberries (*Oxycoccus palustris* Pers.).

From the Spit the low meadows extend for 2-3 km along the lagoon shore. Common hygrophytes are represented here: *Caltha palustris* L., different species of sedges (*Carex acuta* L., *C. disticha* Huds., *C. rostrata* Stokes), reed (*Phragmites australis* (Cav.) Trin. ex Steud.) etc.

Small areas are covered by pasture meadows with *xerophilea* and *mezophylea* grasses.

Flowers and ferns account for about 700 species, lichens for more than 20, mosses for nearly 40 and mushrooms for nearly 300 species (not including the soil microflora).

The only habitat of *Linnaea borealis* L. in the Kaliningrad Region is situated on the Spit, as well as one of the few habitats of *Botrychium simplex* E. Hitchc. in the region; the largest population of *Lunaria rediviva* L. is found here. More than 10 species of orchids are noted here as well as some endemic species of the Baltic coast, the relics of Quaternary flora.

58 species of grass plants found on the Curonian Spit are rare and protected species; a number of species are on the verge of extinction, including: *Erica tetralix*, *Glaux maritima*, *Aira praecox*, *Juncus gerardii*, *Triglochin maritima*, *Eringium maritima*.

Animals

Animal kingdom of the Curonian Spit differs with some special traits that make it a unique one. These special features include: extremely high species variety for such a small territory and "saturation with life"; concentration of large amounts of birds in connection with the main migration way that passes there and connects Scandinavia, Baltic region and the North-eastern part of Russia with the Southern Europe and Africa. Intense succession processes in the young ecosystems of the Spit lead to rapid changes in the fauna complex, thus providing really invaluable material for the scientific research and biological monitoring.

The vertebrate fauna accounts for 338 species. 28 species among them are under the

threat of extinction in Lithuania, Russia and in the whole world. That is why they are included into the Red Books of Lithuania, Russia and IUCN (appendix 4.2).

Among the aquatic invertebrates there are many relics of Arctic and Sub-Arctic faunas remaining here since early Holocene.

Fish

The ichthyofauna of the Curonian Lagoon accounts for 42 species of fish and *Cyclostomata*. *Abramis brama*, *Osmerus eperlanus*, *Stizostedion lucioperka*, *Anguilla anguilla* prevail. *Coregonus lavaretus* came from the Baltic Sea. In the coastal seawaters almost all the spectrum of the Southern Baltic fish species is found over the course of the year.

The coastal waters of the Curonian Lagoon are the sanctuary for such rare and threatened species as *Petromyzon marinus*, *Salmo salar*, *Salmo trutta trutta*, *Alosa fallax*, *Alosa alosa*, *Silurus glanis*, *Vimba vimba* and others.

Birds

Curonian Spit is located along the way of the main bird migration routes. This fact conditions high density of birds on the Spit during spring and fall migration periods. The geographic position of the Curonian Spit, that spreads from the north-east to the south-west, makes it a unique natural “bridge” for the land species of birds, migrating along the White-Sea-Baltic way and avoiding the flight above the open sea. Annually from 10 to 20 million of migrating birds fly over the limits of the strip with the width of only about 1 km during spring and fall periods. Considerable part of them stops for rest and breeding. Among the migrants the most numerous are *Fringilla coelebs*, *Sturnus vulgaris*, *Phylloscopus trochilus*, *Regulus regulus*, *Spinus spinus*, *Parus major*, *Fringilla montifringilla*, *Erithacus rubecula*, *Turdus philomelos*, *Parus ater*, *Columba palumbus*. The owls and birds of prey are passing through in large quantities. The shores of the Curonian Spit and coastal areas of the aquatory are places of rest for hundreds of thousands of aquatic and sub-aquatic birds. Among the migratory birds there are a lot of rare and threatened species, included into the Red Books of Russia, Europe and the World, including *Cygnus bewickii*, *Anser erythropus*, *Branta bernicla*, *Pandion haliaetus*, *Aquila clanga*, *Aquila chrysaetos*, *Haliaeetus albicilla*, *Falco peregrinus*, *Gallinago media*, *Numenius arquata* and others. Many species of migratory birds including the rare and disappearing ones form the largest part of the animal kingdom of the Curonian Spit in summer time as well. Some of them nest there periodically. A considerable part of North European populations of *Melanitta fusca*, *Clangula hyemalis*, *Somateria mollissima*, *Mergus merganser* is gathering for wintering in the Curonian Lagoon.

Since birds of passage concentrate in such large quantities only on the Curonian Spit, it is the most important link in the chain of natural protected territories on the route of the White-Sea-Baltic bird migration way.

The total ornithofauna of the Curonian Spit accounts for 251 bird species, among them 106 species are nesting permanently. The nesting fauna is typical for the Eastern Baltic Region and includes both Western European and Southern species (*Cygnus olor*, *Tadorna tadorna*, *Columba palumbus*, *Strix aluco*, *Upupa epops*, *Crex crex*, *Picus viridis*, *Lullula arborea*) as well as typical taiga species of Siberian origin (*Dryocopus martius*, *Nucifraga caryocatactes*, *Pyrrhula pyrrhula*, *Parus montanus*, *Siphia parva*). Coastal beaches are nesting areas of presently rare in Europe bird species: *Charadrius hiaticula*, *Calidris alpina*, *Haematopus ostralegus*. Nesting colony of *Ardea cinerea* near the Lesnoje settlement is known for many decades (photo 12).

The Curonian Spit and Curonian Lagoon area are the largest coastal wintering site in Lithuania. Every year this area holds about 6-7% of the total Western Palearctic population of Velvet Scoter (15,000 - 20,000), significant numbers of Eiders and Long-tailed Ducks. About 3% of the total NW European population of Goosanders (about 4,000) are wintering in the Curonian Lagoon, mainly near the Curonian Spit shores. The Curonian Spit and surrounding waters are an important passage site for many migratory birds. There are breeding sites of *Tadorna tadorna*,

Haematopus ostralegus, Calidris alpina.

Mammals

The mammal fauna of the Curonian Spit accounts for 35 species. The prolonged conservation regime, the mosaic of habitats and total terrestrial insufficiency contribute to a high density of a majority of animal species and create the unique conditions for observing them. Commonly encountered species are elk *Alces alces*, European roe deer *Capreolus capreolus*, wild boar *Sus scrofa*, fox *Vulpes vulpes*, wood marten *Martes martes*, stoat *Mustela erminea*, badger *Meles meles*, *Lepus europaeus*, ordinary squirrel *Sciurus vulgaris*, beaver *Castor fiber*. The regular stops of *Lynx lynx* are marked. Among the most rare and protected species there are river otter *Lutra lutra*, grey seal *Halichoerus grypus* and mouse-baby *Micromys minutus*.

Historically the Curonian Spit fauna formed on the basis of animal migration from the neighbouring regions of the continent. The process of settlement also continues now, first of all, because penetrating the Spit is a rather difficult task for terrestrial animals, and secondly because of the development of the succession processes in the Spit ecosystems leading to radical changes in the biotopes. Presence of bird migration way and transforming human activities contribute to enrichment of the Spit fauna complex. Relatively recently *Vipera berus*, *Ondatra zibethica*, *Nyctereutes procynoides*, *Mustela vison* entered the Spit community. Beaver and wild boar were re-acclimatised.

Cultural values

The former settlements were covered by sand after cutting the forests on the Curonian Spit. Some of the buildings have been moved to other places several times. Not all places of the former settlements are known. Traditionally, because of natural (climatic, geomorphic, other) conditions settlements were established at the Curonian Lagoon coast. A specific structure of fishermen-stead was formed. 2-3 buildings (dwelling house, smoke-house, other) were located at the borders of plots. Even orientation of ethnographic houses was typical.

Settlements created on the Curonian Spit before the beginning of 19th century are typical fishermen villages - the most significant monuments of the living style and ethnographic traditions of the kursiai community, which does not exist any more in the Curonian Spit.

The 19th century is the beginning of the construction of buildings in professional manner. Lighthouses, churches, school houses, villas, hotels were constructed in a style specific to the Curonian Spit.

The settlements of the Curonian Spit are examples of adaptation of living sites to natural conditions, examples of harmony with nature.

There are 161 objects in the register of the cultural heritage of the Republic of Lithuania and 15 in that of the Russian Federation (Attachment 4).

Settlements

The biggest and the richest value of the cultural heritage of the Curonian Spit are the old fishermen's settlements. The first knowledge about the settlements of the Curonian Spit in historical resources reaches the middle of the 13th century (it is related to marches of the Livonian Order to Klaipėda). The old road connecting Königsberg with Ryga and leading through the Spit since the oldest times, which later became a carrier-highway had influence on its inhabitation and places of settlement. Post stations and those for changing horses are mentioned to have been on this road. Privileged taverns and inns were at those stations. Settlements established before the felling of the forests later were buried under the sand or their buildings were moved. Since the beginning of the 19th century the settlements in the Curonian Spit were founded only along the coast of the Curonian Lagoon, in safer places. Long and narrow homestead plots used to stretch from the Lagoon to the remote littoral road. At the end of the 19th century buildings of professional architecture started to be built in the settlements of the Spit - lighthouses, churches, school-buildings, villas which under the influence of local traditions acquired original style. Typical littoral fishermen's settlements formed until the beginning of the 20th century. Changes in the layout of buildings and architecture started finding expression after

the landscape of the spit acquired recreational significance and inhabited places became important as resort areas. Juodkrantė has already been famous as a health-resort since 1840, Nida, Preila and Pervalka were granted the rights of health-resorts in 1933. Needs of a health resort and new building materials were changing the traditional layout of buildings in fishermen's settlements and the scenery. Environment of the settlements, contiguity with the sea and the lagoon has changed (the houses used to be drawn further from the lagoon, built nearer to the littoral road). The forest surrounding the settlements was looked after following the principles applied to the park, tracks for airing were arranged, lanes to the sea laid, beaches arranged. Such settlements together with the surrounding zone create peculiar natural-cultural-recreational complexes, which witness historical adaptability of the settlements to the environment.

The settlement of Nida is four kilometres from Kaliningrad region. The settlement is linear in plan (the main street stretches along the coast of the Lagoon), it developed spontaneously. Its planned and volumetric spatial composition has virtually formed until the end of the 19th century. Some side streets, most often dead-ended, run into the main one. The character of building was determined by the landscape: extension to the west was limited by sandy dunes covered with forest, to the East - by the Lagoon. A dense network of paths and roads connects Nida with the lagoon and the sea. This formed an integral geocultural complex. Nida is the largest settlement in the Curonian Spit.

The settlement of Preila is 9 km north of Nida. The first homesteads of the settlement originated not scatteredly, but in groups, forming peculiar urban complexes. The majority of residents of Preila were fishermen, so they settled on the coast of the Lagoon, their homesteads were built nearer to the water. The main element - a street-road - runs along the western side of the settlement and separates the territory from the surrounding forest. There were no transversal practicable roads towards the Lagoon. The network of roads-streets and paths was simple and practical and remained almost unchanged until now. The country-like character of Preila is especially valuable, ethnographic singularity is maintained though buildings of the beginning of the 19th century have not remained.

Pervalka is the smallest settlement on the Curonian Spit after Alksnynė. It is situated half way between Nida and Juodkrantė (13 km away from Nida). The majority of the homesteads were founded along the Curonian Lagoon, all the homesteads are situated between the littoral road and the Lagoon. Up to the 3rd decade of the 20th century it was a fishermen's settlement with compact one-side building. During the post-Second World War period the majority of homesteads were demolished. Today Pervalka is a settlement of imitative modern architecture.

The landscape stipulated a unique planned and spatial structure of the settlement of Juodkrantė. The settlement stretched along the Lagoon on the western side of the road intervening into the valleys of dune crests and getting across the road to the eastern side. The settlement is divided into separate parts by the dune crests covered with forest. Up to 1942 Juodkrantė was the most important fishermen's settlement in the Curonian Spit and the most significant health resort in it. From the 17th up to 20th century 7 separate settlements formed in its territory, they differ in their plan structure and spatial composition, character of building and architecture rudiments of each can still be observed. At the beginning of this century all of them were united into one urban territorial complex.

The homestead of Alksnynė has been founded between the road and the Lagoon. In the 19th-20th centuries forestry functioned here. The homestead can be seen from the road well and looks like adjoining the dunes, the homestead fits well into the environment of the natural forest.

The north-eastern part of the Curonian Spit is called Smiltynė. Up to the middle of the 19th century it was not urbanised. Its history of a seaside health-resort began in the second half of the 19th century. Since 1900 navigation of ferryboats and ships started between Klaipėda and Smiltynė. During the years of the Republic of Lithuania Smiltynė became not only a famous health-resort but also an important centre of water sports. New roads and paths were laid, landing stages and beaches arranged.

All the settlements mentioned above are on the lists of the cultural heritage of the Republic of Lithuania.

Buildings

The majority of the remaining buildings in the Curonian Spit having cultural value are fishermen's houses built at the end of the 19th century - beginning of the 20th century. They were under thorough repair, were enlarged or even rebuilt in the 3rd and 4th decades of the 20th century. In the middle of the 19th century fishermen's houses were wooden, built of carving pine wall-planks, covered with thatch or reeds. There were 2-3 buildings in the homestead: a wooden house, a cattle-shed, a curing-house situated most often on the sides of the plot leaving a free space for a kitchen garden, berry shrubs, for drying fish-nets. The house was always built near the Lagoon with its butt to them; following the tradition characteristic to the littoral part of Lithuania it was a two-butt house with a spacious porch without floor in the middle where fish-nets used to be repaired. Plots were limited by willow-fences, since the end of the 19th century - most often by wooden constructions or belts of green plantation. Sometimes the plot of the homestead in a settlement was fenced by old fishnets. Littoral architecture is represented by fishermen's houses, which have a distinct ethnographic character. At the beginning of the 20th century needs of a health resort and new building materials caused the change of the traditional layout of buildings and the scenery of the settlements. Hotels, villas were built, fishermen's houses were extended and enlarged: garrets were arranged, one part of the house applied for the needs of holidaymakers, verandas built and enlarged. Many houses used to be built neglecting the traditions of the old fishermen's settlements. The houses were used to be drawn further from the Lagoon and built closer to the littoral road with their side oriented towards the lagoon and the road, walls were planked, ridged roof changed to steep roof, reed coating replaced by tiles. Outer walls most often were painted dark brown or dark blue, perforated finials, so called «žirgeliai», weather-vanes were carved using plant motifs, window rims painted white and bluish. The fisherman's homestead was fenced with wooden constructions and painted brown with white tips. A hybrid of a fisherman's house and villa appears - summer cottages. The plot of a homestead was enlarged and adjusted to summer rest. The layout of buildings in settlements changed. Representational and health resort character of the settlements was determined by timber summer cottages with their side facades to the streets, most often two-storied or with garrets and portals lifted through both stories, and huge verandas. They are decorated with traditional carved elements characteristic to the fishermen's buildings: finials, weather-vanes, shutters.

The lighthouse of Pervalka has technological, architectural and landscape value. It is a volumetric tower built on a man-made island. The island was made of large boulders and reinforced with surrounding concrete blocks. The socle part of the lighthouse is made of hewed stone, the walls - of sheet metal, a survey bridge is on the top of the tower, the roof has a shape of a dome.

The buildings of the Curonian Spit having features of the folk architecture and remaining to our days are not only active components of the cultural landscape, but also the national wealth included into the lists of the cultural heritage of the Republic of Lithuania.

There are two neogothic Evangelic Lutheran churches in Neringa (in Juodkrantė and Nida). The Evangelic Lutheran church of Juodkrantė was built in 1884-1885. It is on the way Smiltynė - Nida. The Curonian Lagoon is to the east of the road. The church is a red brick one-nave building, rectangular in plan, with narrower and lower than the nave presbytery ending in a short straight wall. Quadrangular tower nestles up to the northern side of the nave, a low sacristy is on the eastern side near the presbytery. The main facade of the church is symmetrical, vertical in composition. Three-phase tower predominates. At the bottom of the tower there is a sharp-arched portal. Sharp-arched windows and contreforces of rectangular section are placed on the side facades. The interior of the church is integral. Decorated timber ceiling and liturgical objects

- the altar, a pulpit, organs - stand out contrastively against the background of the whitewashed plaster walls.

In 1945 this Evangelic Lutheran church was closed. In 1976 a museum of miniatures was established in it. The church was returned to Lutherans in 1988. Catholics use this building together with them. In 1995 the interior of the church was repaired. Means for the repairs were received from Germany.

Evangelic Lutheran church of Nida was built in 1887-1888. It stands on the hill in the outskirts of the forest surrounded by pine trees. Cemetery is north from the church, Pamario street is to the east. A staircase leads to the church from it. The church is a one nave building of red bricks, rectangular in plan, with a narrower and lower than the nave presbytery ending in a straight wall. On the north side a quadrangular tower slightly protrudes through the volume of the nave. The main facade is symmetrical. Three-phase tower predominates in it. The tall middle phase is divided by a group of narrow bays and a little round window. The most decorative is the upper phase. The interior of the church is integral. Dark timber ceiling and a gallery surrounding the nave from three sides stand out contrastively against the background of whitewashed plastered walls. An oak altar stands in the presbytery separated by the triumphal arch, three sharp-arched stained-glass windows are on the end wall behind it. After 1960 this Evangelic Lutheran church was closed. In 1969-1988 historical museum of Neringa was functioning in it.

In 1988 the church was returned to the believers. The church is used by Catholics too. In 1991 the presbytery was painted restoring former colours, an oak altar and pulpit made as well as new desks.

Up to the middle of the 19th century the approaches of Klaipėda were not protected. In 1865 construction of a fort of Neringa was commenced at the end of the cape. Its building was finished in 1871, but during the war it was blown up. In 1969 the decision was taken to establish a sea museum in the fort. It is a fortified hexagonal building applied to a long-lasting circular defence built following the directions by Otto von Bismark, a statesman of Germany.

The fort and both neogothic Evangelic Lutheran churches are inscribed into the list of the register of cultural heritage of the Republic of Lithuania.

Other Sites and Places

Every fishermen's village in the Curonian Spit, bigger or smaller settlement had its own cemetery with gravestone monuments characteristic to residents of Neringa only - krikštai. Krikštas is one of the oldest forms of gravestone monuments in Lithuania and started to be erected since the 17th century. Those were differently profiled timber planks depicting flowers, heads of birds and horses, a man's silhouette, etc. The majority of buried people were fishermen. In places where villages were covered with sand no cemeteries survived.

All four of the remaining settlements of the Curonian Spit - Nida, Preila, Pervalka and Juodkrantė - have their old cemeteries. The biggest and the best looked after cemetery is the old cemetery of Nida. Old cemeteries of Preila and Pervalka are much smaller. There are quite a number of graves that are not looked after, krikštai have disappeared, wooden crosses are vanishing. Only a part of the old cemetery is still there in Juodkrantė where it was started to bury people again in the post-war period after the old gravestone monuments disappeared.

Two main groups of the old gravestone monuments have remained in all the cemeteries of the Curonian Spit - wooden and metal. Wooden monuments are low timber crosses and krikštai. Krikštai survived and are best preserved only in the old cemetery of Nida. In 1975 they were restored thanks to the concern and efforts of the folk master Eduardas Jonušas.

The metallic monuments are most often massive forged or cast crosses of similar style made in Lithuania or Germany and characteristic to the end of the 19th -the beginning of the 20th centuries. Porcelain (or sometimes- wooden) plates with names and dates, often with epitaph, were usually fixed onto them. Quite a number of metal monuments have artistic value.

Separate notice should be given to the cemetery of the planters of trees and shrubs on dunes where planters Gottliebas Kuvertas and his son Georgas Dovydas Kuvertas are buried.

Seeking to perpetuate their memory residents of Nida ordered a gravestone monument. This monument in the style of classicism was made in Konigsberg, Germany in 1864.

All the cemeteries of the Curonian Spit have been researched, historical investigations made, projects for trimming the cemeteries prepared.

It's interesting to note that the high dunes of the Curonian Spit were used for gliding. In 1933 on the initiative and efforts of the aviation circle of Kaunas high school the first gliding school in Lithuania was established in Nida which later became a primary sport base of the world famous glider-pilots. Using the advantage of the unique natural conditions world known engineless flights were conducted here

All the old graveyards and other memorial places of the Curonian Spit are included into the Register of the Cultural Heritage of the Republic of Lithuania.

Natural resources

The main natural resources of the Curonian Spit are timber resources, natural recreational resources - forests, beaches, aquatories and aesthetic values, fish resources, and mineral resources (amber).

The timber resources are not of high quality. On the other hand, the use of timber resources is forbidden due to conservational regime. Only some sanitary or aesthetical forest felling is allowed, and some timber resources can be used for heating. Gathering of mushrooms is popular in the forests of the Curonian Spit.

Natural recreation resources (dry pine forests, wide sandy beaches, shallow sand banks, clean sea waters, as well as scenic views) of the Curonian Spit are of a very high quality and have a great potential for the development of recreational industry. However, the nature and culture heritage conservation is the first priority, and valid legislation imposes limitations on the development of recreational industry. Intensive recreational activities can be developed only in the settlements and their adjacent areas. For this purpose special recreational zones are established. Development of ecotourism has good prospects on the Curonian Spit.

Fishing in the Curonian Lagoon has long-standing traditions. Not all aquatory of the Curonian Lagoon is inside the National Park, so it is difficult to describe the real amount of fish resources in the park.

Some amber resources exist in the Curonian Spit and in the aquatory of the Curonian Lagoon. At present, amber is not excavated, and the possibilities for such an activity shall be further investigated.

In front of Nida, some 30 km off into the Baltic Sea, several oil fields have been discovered. It has been decided not to proceed with their exploitation.

b) History and Development

About 5 thousand years ago, at the beginning of the period named "Littorina" after the then-plentiful Baltic Sea mollusc, the slowly rising eastern shore of the Baltic underwent increased destructive impact of waves. The destruction of the shore was going on a bit further to the south, on the Sambia peninsula. A good deal of sand was washed away, and southwestern currents carried it northwards. The sand settled forming continuous shoals among the islands. Starting with the southern part, a prolonged belt of sandy land was forming based on a foundation of moraine islands and banks. In the course of time winds began to pull its surface into dunes. The spit elongated and grew higher. It was growing.

Beginning from the 1st Millenium BC and till the 16th Century the relief of the Curonian Spit differed from the modern one. The beach had been finished by an advanced range of white dunes with the complex of Psammophitae (sand-lovers). For the first time the moving dunes are mentioned in the Livland poetical chronicles or beginning from the second half of the 13th Century.

Gaps or so cold «gates of blowing away» divided the white dunes. The sea waves or the sand from the beach or from the dune slopes broke through them into the inner part of the Spit

depending on the weather. As the sand has been accumulated the “gates of blowing away” became closed by a new advanced deep into the Spit dune.

In cold and dry climatic phases the processes of sand accumulation prevailed, and in warm and humid phases the processes of the avant-dunes erosion prevailed. The breaching of the sea water in the most low places lead to the straight formation (the root of a spit in the area of the Lesnoje and Rybachy settlements). The short-termed breaching of the sea water into the spit were marked in 1404, 1441, 1497, 1509, 1680, 1791, 1818, 1830, 1874, 1889, 1895, 1962, 1983, 1990-91. The works for the shores strengthening with dams, made from brushwood and sacks with sand in the southern part of the spit are named beginning from the 15th Century.

The white dunes were followed by the grey dunes, protected from the wind with the better developed vegetation cover. They in turn were separated from the oldest dunes covered with forest. The depressions often had a high level of ground waters and were marshy. Over the times of mass sand movement dunes have filled in these depressions.

Thus, highly divided terrain prevailed in the spit relief. It consisted of the connecting parabolic dunes of two generations, which in some places cover each other. It looked like “large number of mountains and deep valleys”. The vegetation cover, that preserved those dunes from erosion during two thousand years, differed with a high variety beginning from the steady to drought *Psammophitae* on moving dunes to *Gigrophitae* in the reductions and *Evtrophae* on the oldest soils.

Even before the final formation of the Spit wandering people of the Middle Stone Age came to these places (about 5,000 - 6,000 thousand years ago). Traces of their later presence are found all over the Spit. The ancient population of the Spit was able to process stone, which they brought in from remote places to produce tools out of bone, to produce pottery, catch fish, and later also to trade with other lands (coins are often found).

At the first Millennium AD the representatives of the West Baltic tribes (Curonians and Prussians) inhabited the spit. Their settlements on the Spit had a seasonal character for the periods of fish stocking up or had a sacral meaning. Such a situation and the worldviews of the pagans guaranteed the development of the natural processes on the spit.

The rise in temperature in Europe during the climatic optimum (IX-X centuries) led to the rise of the sea level and to the formation of the Brockist straight in the root part of the spit. It was covered with sand only in the XII century. The suitable geographic position of the straight became, to all appearances, the main reason of the foundation of the pagan trade centre Kaup (800-1016) near it. For Europe such an archaeological monument, that lies near the spit root, is unique because it is the last non-researched large proto-urbanic complex (settlement and grave) of the Viking epoch.

In the XIII century the independent history of the West Balts was interrupted by the invasion to Prussia by the Tevton Order crusaders. The historical materials of that time testify that the Spit length in the XIII century was close to the modern one.

Gradually during the XIII century the Prussians were partly conquered and partly forced out to Lithuania. But the armed conflicts with the Balts continue up till the XV century. With the beginning of military actions the Curonian Spit receives the strategic importance as a military highway, that connects the centre of the Sambian peninsula with Lithuania. That's why for the protection of that direction the Order builds the castles Memel in 1252, Noihauz in 1283 and Rossitten in 1372. The colonists' settlements arise around the castles. The settling of the German migrants on the Curonian Spit is accompanied by their adaptation to the new conditions of living. That process begins at the end of the XIII century and continues in the XIV century by road building, tree cutting around the settlements for plough-lands and pastures, building of dwelling and military objects. Expansion of that activity was limited by the military position of the border territory.

The active settlement on the new territories aggravated by wars and epidemics demanded the enormous energy expenditures. To the beginning of the XV century the power of the Tevton

Order becomes weak. The activity of the military actions goes out. The quiet times on the Spit were fixed by the Peace Treaty with Lithuania in 1422. The stabilisation of the political situation makes it possible for the first colony of migrants – fishers-kursiai from Lifland to appear on the Spit and to find here refuge from the oppression of the Livonian Order. Thus the Spit population grows. In the economic activity the craft (fishery and bee-keeping) prevails. That's why the economic pressure to the natural complexes is still not large and is limited by the local needs.

At the beginning of the XVI century after the secularisation of the Order one could observe the economic and political rise of Prussia. Steady development of the industrial production, especially of glass, as well as salt-making, shipbuilding and metallurgy in the states of West Europe and in Prussia itself stipulated the good demand for wood, wood coal and potash. The depletion of those raw resources near the centres of production at that time forced the suppliers to search for new sources of raw materials. The existence of timber on the Spit together with its cheap delivery by water transport stipulated the low cost of the raw materials and good incomes.

Such a political situation and the pre-conditions, formed in the inner and outer markets led to the huge overall tree felling on the spit. The considerable part of woods was cut for local economic needs. High-standing plantings were replaced by waste grounds. The practice of burning them by bee-keepers led to complete degradation of the vegetation. Having lost the forest cover, the sands began to move under the influence of wind.

The first mentioning of sands invading the settlements is related to XVI century. At that time some areas of the Spit were blocked with sand. Till the end of the XVIII century some communities had well preserved parts of forest, later in the XIX century they disappeared everywhere except Rossitten, Nidden (Nida), Schwarzort (Juodkrantė) and an area between Krantz (Zelenogradsk) and Grentz localities (7th km of the Spit length).

In the XVI century a new process of dune formation began. First of all the sharp grains of sand, moving close to the surface, would grind the stems of the trees, removing the bark and leaving them standing white as if barefoot. Billions of sand grains rose in whirlwinds, forming sand drifts, towering like white, menacing, corniced mountains over the roofs of the small villages from the western side. Sand penetrated into the cottages, people's beds, seeped between the teeth while eating bread or fish and seemed to have penetrated into the very heart of man... For several hundred years unrestricted whirlwinds of sand droned their threatening melody. About 15 villages were unable to resist the assault of sand and are buried under 30 - 40 meter-high mountains of white sand. Others either moved to new places or escaped to other settlements, often failing to find comfort even there.

The blowing away of the sand deposits of the ancient dunes, replenished with the fresh arrivals of sand from the beach, led to the changes in relief and to the full transformation into a desert. The remains of the ancient dunes were later covered with a layer of fresh sand. By the end of the XVIII century the prevailing element of contemporary relief - longitudinal range of high dunes had been formed.

Desertification had led to almost complete loss of the gene fund of indigenous ligneous biocoenoses, which were later replaced by introduced species and ecotopes of not local common pine.

The development of the negative consequences of the sandy catastrophe and in particular a constant threat of the settlements to be covered by sand, the threat to the existence of a transit route along the spit, progressive shallowing of the ship canal and the lagoon, forced the Administration of the State Lands Management to allocate the necessary sums of money and to elaborate the measures to fix the moving sands.

The activities aimed for coping with these catastrophic consequences had two main directions:

1. The creation of the sandy protection bank that would cut off the possibility of sand progressing further into the Spit. The main works for that bank construction were begun in 1805.

The complete building of the protection bank had been finished at the end of the XIX century. Till the present time the constant work for the restoration of the wrecked by erosion plots is carried out.

2. Some time later there were begun the works for fixing the moving dunes' slopes with the small fences made from brushwood, and forest planting. Those works firstly were begun by the Memel merchantry on the North end of the Spit. In 1825 a plantation was founded in Nida, in 1843 – on palve near Rossitten, in 1877-1882 – near Rossitten and Schwarzort (Juodkrantė). In 1887-1891 forest cultures on the dune of Petschberg near Pilkoppen (Morskoje) were created. The fixing of a plot between Preil (Preila) and Pervalka took place beginning from 1897. To the end of the XIX century the area covered with forest totalled to nearly 50 per cent.

For several months since January 1945 the Curonian Spit was a zone of active war fights. As a result more than 800 ha of woods were burned. In many plots the sand movement renewed because of the destruction of the vegetation cover by fires, bombs and heavy machines.

After the Second World War the forest restoration activities began on the Spit again. The connection of separate avant-dunes into an overall protection bank played a considerable role in the development of the sandy pour of the spit. The sand arriving from the beach and its accumulation in the inner part of the spit had stopped. The sand, stopped on the beach by the protection bank is blown away by the winter storms. Thus the growth of the Spit from the seaside widthwise had stopped.

The other consequence of the overall bank creation is the formation of the asymmetrical tub-like structure of the Spit in the transverse profile. The walls of the "tub" are formed by the beach protection bank and a range of high dunes. That is why palve is a closed drainage area. In the years of extremely high humidification the low areas of palve are subject to prolonged flooding by ground waters. The largest scale of this phenomenon during this century took place in 1981-1982. At that time some plots looked like an overall stretches of open aquatories. Later the prolonged under-flooding led to death of the woods in such areas. Presently these dead woods have been naturally replaced by birch and alder woods.

Human activity always influenced the vegetation cover of the Curonian Spit. Since the Spit consists of sandy dunes, the vegetation that serves as the sand-fixing agent, has always been the necessary condition of its existence. The history of the phytomelioration on the Spit accounts for more than 200 years. In 1605 the woods covered 75 per cent of the Spit; in 1700, as a result of the cuttings, only 10 per cent of the forest covered area remained. Due to the sand-fixing works initiated in the second half of the XVIII and continued in the XIX centuries, it became possible not only to stop the destruction of the vegetation cover, but also to create the coastal bank (avant-dune) with a length of 10 km in 1830 (stretching from contemporary Zelenogradsk to Lesnoje settlement) (photo 2). In the middle of the XIX century the overall construction of this protecting coastal bank was finished. At the beginning of the XX century the Spit forest coverage already made up more than 50 per cent. Nowadays the forest cover of the Russian part of the Curonian Spit reaches 71 per cent.

The formation of the fauna complex of the Spit also continues. The migration ways of birds, that pass through the spit and species acclimatisation activity carried out by man contribute to this process. Numerous introducents (raccoon dog, American mink, squirrel-teleut, musk-rat and others) appeared in the local fauna. This way the intensive natural processes of the natural development of landscapes (the bogging of a part of territory, blowing of the sands on the dunes, replacement of animal and plant species, etc) are continuing on the Curonian Spit. That makes its natural complex sensitive to anthropogenic influence. At the same time, the Curonian Spit is an example of adaptive land - use formed as a result of the influence of dynamic natural processes.

Over the last decades the nature protection regimen of cultural and natural systems of the Spit has become more stringent: the regime of hunting (later of a landscape) reserve has been installed; the visitors' flow was limited, the volumes of wood felling were reduced; the territory improvement is being done. After the National Parks' opening since the 1987 on the Russian

side, and since 1991 on the Lithuanian, the protective measures got even larger development.

History of the Scientific Researches

At the end of XIX century the German ornithologists discovered that the Curonian Spit serves as a route of flight of a huge amount of birds and represents an extremely favourable place for the migration research. In 1901 I.Thienemann founded the first ornithological station in the world "Vogelwarte Rossitten" in Rossitten (present Rybachy). For the first time in the world the method of bird ringing was applied here on a large scale. This method was offered not long ago before that by H.Mortensen. More than 1 million of migrating birds of different species was ringed by the station before 1942. "Vogelwarte Rossitten" became the leading ornithological institution in Europe and all over the world in the field of bird migration research. Already in 1931 the German ornithologists had succeeded in preparation of the first bird migration Atlas (Schuz, Weigold, 1931).

In 1956 Ornithological (later -Biological) Station of the Zoology Institute of the Academy of Sciences of the USSR was organised in Rybachy settlement. From the moment of appearing till now the base of the Biostation activity on the Curonian Spit is constituted by the fundamental researches in the field of migrations and the mass ringing of migratory birds.

The station staff annually rings from 60 to 100 thousand birds of passage. Since 1957 more than 1,5 million birds (more than 170 species) were ringed on the Biostation. By now more than 7 thousand of distant repeated findings of rings and nearly 30 thousand of repeated catches of the birds ringed on the Curonian Spit were noted.

The Biostation also carries out the fundamental researches in the area of population ecology, demography and terrestrial behaviour of the model bird species. Practically all the European scale projects connected with the migratory bird studies foresee the participation of the biological station in Rybachy settlement.

The data of calculations made on the Curonian Spit allows to state the changes in the numbers of different species on the very large areas of the northeast of Europe. For that reason biomonitoring became one of the main directions in the research of the migrating birds on the Curonian Spit over the last years. The researches are carried out in co-operation with the staff of the "Vogelwarte Radolfzell" Ornithological Station.

c) The Format and Date of Most Recent Records of the Property

- the stock taking of forest resources as of 01.01.1998 (the characteristics and the condition of the forest fund);
- Annual reports of the National Parks (Lithuanian and Russian parts) for 1998;
- the reference materials of the park management and of the Zelenogradsk administration about the National Park visitation by the tourists in 1997;
- the reference materials about the social-economic state of the object.

d) Present State of Conservation is reflected in the following scientific publications:

1. Boldyrev V.L. Curonian Spit: the condition of its coastal zone and the questions of the coast protection. // Problems of research and nature conservation of the Curonian Spit. Kaliningrad, 1998. (Russ.)
2. Bolshakov K.V., Fedorov V.A. Ornithological research and questions of birds protection on the Curonian Spit. // Problems of research and nature conservation of the Curonian Spit. Kaliningrad, 1998. (Russ.)
3. Goushchin A.V. Flora, fauna of the coastal waters of the «Kurshskaja Kosa» National Park and the anthropogenic influence. // Problems of research and nature conservation of the Curonian Spit. Kaliningrad, 1998. (Russ.)
4. Koucheneva G.G. Level of investigation of flora and vegetation of the Curonian Spit. // Problems of research and nature conservation of the Curonian Spit. Kaliningrad, 1998. (Russ.)
5. Koulakov V.I. "Curonian Spit -the unique monument of nature and object of the cultural and

- historical heritage", manuscript, 1998.
6. Maslov A.D., Matoussevich L.S. Forest pathological condition of the «Kurshskaja Kosa» National park. // Problems of research and nature conservation of the Curonian Spit. Kaliningrad, 1998. (Russ.)

The comparative data of forest resources calculation

	Russian part 1997	Lithuanian part 1998
Forest lands	70,8%	73 %
Grounds, covered with forest vegetation	67,6%	72%
Artificial plantings	37,8%	64%
Coniferous plantings	63,3%	82%
Hard-leaved plantings	0,5%	-
Grounds, uncovered with forest vegetation	2,8%	28%

Modern forms of territorial conservation and organisation include:

a) on the Lithuanian part - the National Park Administration and structural subdivisions of the park (4 forestries, 10 forest inspections).

Park protection service (49 persons):

b) On the Russian part they are represented by the National Park administration and structural subdivisions of the park (2 forestries, 8 forest inspections);

Park-protecting service (23 persons).

Presence of the most valuable sites, including:

a) Within the Lithuanian part of the Spit - 2 preserves with strict nature conservation regime; 4 landscape preserves; 6 ethnographic preserves; 10 natural memorials. Valuable cultural sites included into the catalogue of non-transportable valuables, including: 6 urban areas, 79 buildings (architectural, historical and technological valuables), 3 cemeteries (historical, ethnographic and artistic valuables);

b) On the Russian part of the Spit there are 4 preserves with strict nature protection regime, 6 natural memorials, 6 reserves.

e) Policy and Programs on Territory of the Nominated Object

The information and propaganda activity was organised using the following ways: publishing and spreading brochures, booklets, guides and calendars; through the information centres and park museum; by lecturing and organising excursions for the school-children, through the school forestry's organisation; with the help of publications and mass media (radio, TV, newspapers).

4. Management

a) Owner

On the Lithuanian side the territory and aquatory of the National Park "Kuršių Nerija" is the state property.

On the Russian side, the "Kurshskaja Kosa" National Park is the specially protected territory of Federal importance. It is the property of the Russian Federation. Lands, waters, subsurface minerals, vegetable and animal world within the grounds of the National Park are in the management authority of the National Park according to the state decision. Buildings, structures, historical, cultural and other immovable property located within the boundaries of the park are assigned to be operated by the national park as well. On behalf of the state the operation of NP is carried out by the Administration of the NP "Kurshskaja Kosa".

b) Legal Status

Legal Status– National Park. Defined by the state regulations:

The Lithuanian part: Decision of the Supreme Council of the Republic of Lithuania dated 23.04. 1991 Nr. I-1224 "On establishment of National Parks Dzūkija, Kuršių Nerija, Žemaitija, Historical National Park Trakai and State Strict Reserve Viešvile." Ministries of Environment and Culture, as well as Neringa and Klaipėda municipalities exercise control of the National Park in compliance with the state regulations.

The Russian part: Resolution of the Council of Ministers of the RSFSR dated 06.11.1987 № 423 "On establishment of state nature national park "Kurshskaja Kosa" in Kalinin- gradskaya Oblast", with the following Resolution of the Government of the Russian Federation dated 09.10.1995 № 990, confirming the governmental decision of 1987 and defining the changes in the name of the park (excluding the words "state nature").

Federal Forestry Service of Russia, Forestry Department of Kaliningrad, Regional Nature Protection Committee, Administrative bodies of Zelenogradsk carry out control of the National Park in compliance with the regulatory documents and of its operational activities.

c) Protective Measures and means of implementing them

On the Lithuanian part:

Defined in Management Plan (Planning scheme) of the NP "Kurshskaya Kosa" and by Resolution on the NP "Kuršių Nerija", approved by the Government of Lithuania in 1994 and 1995.

Various types of protective measures and means of implementation can be observed in the NP. They can be classified as follows:

- legislative (see also other paragraphs): set the conservation policy and the main directions for protection (conservation, protection or other regimes);
- territorial planning (general, special and detailed): set the functional zones, priorities of conservation, recreation or other kind of activities on the territory; site-specific protective measures; any kind of activities can be implemented only in accordance with approved territorial planning documents;
- economic: regulate the number of visitors;
- scientific: provide background for preparation of territorial planning documents, implementation of monitoring system, concrete measures, etc.;
- concrete measures (on-going activities):
 - * implementation of forestry management plans;
 - * implementation of coasts conservation programmes;
 - * conservation, restoration, renovation, etc. of old buildings;
 - * restoration of damaged natural values;
 - * implementation of the information signs system;
 - * establishment of pedestrian trails, sightseeing places, etc. for cognitive tourism (ecotourism); etc.

To ensure implementation of natural and cultural heritage and cultural landscape conservation measures, the decision to have all the land of the Curonian Spit in the state ownership was approved by the Supreme Council (the Parliament).

On the Russian part:

Defined in the Federal Law of RF "On specially protected natural territories", 1995 (articles 5, 15, 33, 34) and by "Provision on National Park "Kurshskaya Kosa", 1993, approved by the Federal Forestry Service of Russia;

Natural Complexes and Objects Conservation on the Territory of the "Kurshskaja Kosa" National Park

1. Observance of the National Park “Kurshskaja Kosa” National Park regime is secured by its protection guard, that includes:

Director of the National Park and deputy directors, higher State inspectors for NP protection (department directors, foresters, assistant-foresters), divisional State inspectors for NP protection (forest masters, hunting specialists), State inspectors for NP protection (specialists in the matters of rational nature management organisation, forest rangers and huntsmen).

2. Public inspections as well as specialised voluntary groups can be drawn into protection of the National Park “Kurshskaja Kosa” territory. National Park administration and its services interact with the State bodies of water resources and fish protection, of hunting supervision and internal affairs bodies in the issues related to ensuring the protection.

3. Differentiated regime of special protection identifying the specifics of nature conservation in the individual functional zones of the National Park is established. The zones are specified as conservation zone, controlled protection zone, recreational, protective beach dune embankment, etc.

4. In compliance with article 15 of the Federal Law “On specially protected natural territories” any activity, potentially harmful for the natural complexes, vegetation and animals, historical and cultural sites and which is contradictory to the objectives of National Park, is prohibited, in particular:

- subsurface mineral mining;
- construction of automobile main roads, pipelines, power lines; construction and operation of economic and residential structures and facilities, not related to the NP functioning ;
- main and severance felling, tree tapping for turpentine gum, commercial hunting and fishing, commercial wild plant procurement, any activity potentially resulting in violation of vegetation and animal habitat conditions, etc.;

5. On the basis of the special conservation status, the State inspectors of the National Park “Kurshskaja Kosa” protection have the right :

check citizens’ and functionaries’ documents for their right of staying, crossing, nature use, for carrying out economic or any other activity on the territory of the National park or its security zone;

stop any activity of citizens or functionaries that contradicts the nature protection legislation and regime of the National Park and its security zone ;

visit any enterprises, institutions and organisations, hydrotechnical installations, ships and other vehicles on the territory of the National Park and its security zone for checking up the compliance with the regulations of the nature protection legislation ;

confiscate the products and tools of illegal nature use from the offenders of the nature protection legislation, as well as the corresponding documents in the way envisaged by the current legislation;

draw up statements on the administrative violations in the field of nature protection, as well as about the protection of historical and cultural monuments within the limits of their competence , to deliver the violators to the militia or the local administrations of the settlements;

bring suites against enterprises, institutions, organisations and citizens and their associations for compensation of losses incurred by natural and historic-cultural complexes and objects of the National Park and its security zone as a result of ecological violations and according to the established procedure .

6. Members of the staff of the National Park “Kurshskaja Kosa” protection service have the right to carry weapons in accordance with the Weaponry Table, registered in established way.

7. Conservation zone is subject to the most stringent control.

- ◆ Administrations of the parks (Lithuanian and Russian) and their protection services are directly responsible for protection and conservation of natural and cultural values of

the Curonian Spit;

- ◆ protection is implemented through inspections (patrols) carried out by forestry protection employees (rangers) on daily basis; overall protection of the area is exercised through a system of road patrolling;
- ◆ protection against fires is effected by anti-fire service of the parks, enabled with anti-fire chemical stations, provided with machines and equipment in accord with the existing standards

d) Agencies with Management Authority

Activities of the National Park “Kuršių Nerija” are managed by the administration of the National Park, which is under the jurisdiction of the Department of Forest and Protected Areas under the Ministry of Environment of the Republic of Lithuania. Head of the National Park administration is the Director, appointed by the Head of the Department.

Department of Forest and Protected Areas
under the Ministry of Environment
of the Republic of Lithuania
Juozapavičiaus, 9
Vilnius, LT-2600

The NP management on the Russian part of the territory is fulfilled on two levels: through the Federal administration in Moscow and through the regional one, which is a part of the federal structure.

Russian Federation
Federal Service of Forestry
Piatnitskaia St., 59/19
Moscow, 113184

Forest Administration of the Kaliningrad Region
Sovetsky prospekt, 13
Kaliningrad, 236007

e) Management Realisation Level

The NP Administration address:

Lithuanian part:
Smiltynė 18
5800 Klaipėda
Lithuania
Director: Vladas Portapas

Russian part:
Kaliningradski Region,
Zelenogradsk District,
pos. Ribachy
Lesnaia St., 7
Director: Gennady Tepliakov

f) Agreed Plans Related to the Property

On the Lithuanian part of the area:

Prior to acquisition of the National Park status, the management and development of the Curonian Spit were carried out in compliance with integrated and specialised planning documents and individual resolutions;

According to the Law on Territorial Planning, all activities in the area can be implemented after approval of the territorial planning documents. The main territorial planning document for the Curonian Spit is the Planning scheme (management plan), covering the period until the year 2005, was endorsed by the Government in 1994. This scheme is the background for preparation of special territorial planning documents, such as forestry management plan, recreational development plan, detailed plans for facilitation of the settlements in individual recreational zones and further development of infrastructure.

The following provisions are provided by the National Park management plan:

- to protect, rationally use and restore the nature and cultural heritage and landscape values, and recreational resources,
- to ensure the continuity of architectural traditions in developing settlements, and to provide for the favourable living conditions therein,
- to develop infrastructure,
- to develop recreation and traditional economic activities.

Detailed plans for management of settlements were prepared in 1993, at the same time as the planning scheme. With the exception of the detailed plan of Smiltyne, which was approved in 1994 by the Ministry of Construction and Urban Development and the Ministry of Environmental Protection, these plans have not been approved yet.

Forestry management plan was prepared and approved in 1987. A new one is in an early stage of preparation.

On the Russian part of the area:

1. Resolution of the Government of the Russian Federation dated 06 11 1987 № 423 “About the establishment of the “Kurshskaja Kosa” National Park”, defining its spatial limits and area, including the park properties, the differentiated protection regime (zoning) and objectives of the park.

2. The co-ordinated project materials:

- “The materials, substantiating the organisation of the “Kurshskaja Kosa” National Park” (1987),

- “The project of the National park “Kurshskaja Kosa” General Development Plan” (1989).

- “Working project of the tourist-excursion routes improvement” (1989).

Measures for conservation, control and use of the park resources and the deadlines for their implementation were set out in these projects. The stages of the area organisation, of the main objects’ construction, of the territorial improvements were defined there as well. The types and volumes of the scientific researches and project works were recommended, etc.

3. The current annual production-financial plan are worked out by the park administration and established by the Federal Forestry Service of Russia. They include the concrete types, volumes and timing of measures, cost estimates and the sources of financing.

g) Sources and Levels of Finance

Lithuanian part

Financing sources	1997 Lt./US \$	1998 Lt./US \$
State Budget	900 000/225 000	1 914 000/478 500
Forest Fund	300 000/75 000	190 000/47 500
State Nature Fund	100 000/25 000	206 000/51 500
Municipal Nature Fund	20 000/5 000	16 000/4 000
International support	200 000/50 000	102 000/25 500
Funds owned by the park		184 000/46 000
Total:	1 520 000/380 000	2 612 000/653 000

The average monthly salary in the National Park in 1998 was 900 Lt./ US \$225.

Russian part			
Financing sources	1997	Rbl./US \$	1998 Rbl./US \$
State budget	312 000	62 400	310 000/51 700
Funds owned by the park	868 100	173 600	1 430 000/143 000 ?
Recreation services	1 684 600	336 900	2 244 000/225 000 ?
Other (International aid)	742 900	148 600	1 341 000/134 000 ?
Total:	3 607 600	721 500	5 325 000/553 700 ?

The average monthly salary in the National Park in 1997 was 826 rub/ US \$138, in 1998 - 708 rub/ US \$ 70 (?).

Additional financing is required for repair and maintenance of the protective coastal bank; for driveway repairs and associated activities, for improvement of energy, heating and water supply; for utilisation of domestic wastes.

h) Sources of Expertise and Training in Conservation and Management Techniques

The Lithuanian part:

Out of 71 employees of the NP, 26 have higher education, 10 persons have earned specialised college education. In 1998 5 persons took qualification enhancement courses, 4 employees participated in training seminars.

The Russian part:

11 from 108 members of the NP staff are of higher education and 15 received specialised college education.. In 1997 5 persons were studying without giving up their work.. 4 persons took courses of the qualification enhancement. 12 persons were educated by means of the courses of rangers and the National Park forest protection workers.

i) Visitor Facilities and Statistics

On the Lithuanian part:

Visitor facilities of the Curonian Spit are predominantly located in the settlements of Nida, Juodkrantė, Smiltynė, Preila, Pervalka. There are 80 hotels and summer houses, some restaurants, cafes, etc and most of them are concentrated in Nida. Total accommodation capacity of hotels and summer houses (by beds) amounts to 6.18 thousand persons. Local inhabitants of the Curonian Spit provide additional 3.55 thousand beds in summer time. Construction of new hotels and summer - houses is forbidden, but the old ones can be reconstructed (without visible extension) to meet the needs of visitors.

All the beaches are equipped with relevant facilities; very few forest parks are facilitated. In summer visitors spend their time on the beaches, particularly in Smiltynė area (ten years ago up to 20 thousand visitors per day, now up to 16-17 thousand visitors per day). Smiltynė area is mostly used by single day commuter visitors coming from Klaipėda.

Sea Aquarium is located in Smiltynė area and is very popular among the visitors of the Curonian Spit. The Nature Museum is located close to the Sea Aquarium.

Facilities for ecotourism have not been developed yet.

On the Russian part:

On the park territory there are 2 hotels, 24 tourist hostels, 1 ecological camp ground and the museum of the “Kurshskaja Kosa” National Park;

8 car-parking lots, 8 sightseeing grounds, 56 equipped leisure sites and picnic sites and 7 special swimming places were equipped;

4 marked recreational routes were organised.

There are 1790 places for the holidaymakers in the recreational and tourist facilities.

The numbers of organised tourists who visited the “Kurshskaja Kosa” National Park constituted:

in 1996 – 25,182 persons including 14,772 foreigners

in 1997 – 28,745 persons including 13,855 foreigners

in 1998 – 46,482 persons, including 14,494 foreigners

Together with the holiday-makers the annual number of visitors in 1997 amounted to 94,560 persons.

j) Property Management Plans

The Curonian Spit being an integral natural complex, is divided into two National parks in terms of the administrative subordination. In its Southern part there is the National Park of the Russian Federation and in the Northern - the National park of the Lithuanian Republic.

The National Parks have common objectives: protection of the natural and cultural complexes of the Curonian Spit as a whole. Any activity, that contradicts the aims and tasks of the National Parks, is prohibited on their territories.

In the National Parks Management Plans, co-ordinated with the Park Scientific Council, the following directions of activity are planned:

- widening of protection and scientific research measures
- development of organised ecological tourism along the routs and trails
- improvement of the National Park logistics
- development of the environmental education among the students and pupils
- widening of the tourist services sphere for the National park visitors

In accordance with the developed plans the following zones have been defined:

On the Lithuanian part:

Conservation zone. The conservation zone of the National Park embraces the Grobštas and Nagliai Strict Nature Reserves, Parnidis, Karvaičiai, Juodkrantė, Lapnugaris Landscape Reserves, the Senosios Ievos Hill settlements, the Juodkrantė urban reserve, the ethnocultural reserves of Naujieji Karvaičiai, the 1 and 2 zones of the Inkaras village, the Žvejai village in Juodkrantė and Senoji Preila.

The aim of strict nature reserves is to conserve the original landscape of the Curonian Spit being the unique segments of the great dune-ridge of the moving and gray dunes, blown-out remnants area and seaside blown sand plain (palvė) landscape.

The landscape reserves are aimed at preserving the original landscape of the Curonian Spit with the different fragments of the great and protective coastal dune-ridges, dunes of the contrasting seaside and lagoon side palvė, the great capes of the lagoon side.

Protection zone. The protection zone consists of Nida wellhead protection area, and Smiltynė protective zones.

Recreation zone. The recreational zone of the National Park includes the park woods of the settlements and seaside dunes and beaches.

Residential zone. The residential zone of the National Park consists of Nida, Preila, Pervalka, Juodkrantė, Alksnynė and Smiltynė settlements. The requirements of residential area have to be met by managing the present buildings and making the built-up areas denser. It is anticipated, that economic activities within the park and municipality along with natural population increase would secure sustainable development on the Spit.

Economic zone. The economic zone of the National Park includes the present public utility zones and zones provided for their expansion in the limits of Nida, Preila, Pervalka, Juodkrantė and Alksnynė settlements.

The planning principles of the environment conservation on the Russian part of the area are formed as follows:

- priority of conservation in all decisions made and measures taken;

- The precise observance of the functional zoning principle with the different regime of conservation and use of the National Park area. Five functional zones with different protection regimes are defined within the National Park area.
 - Conservation area – 45% of the park territory
 - Protective beach dune embankment is defined as a zone of special conservation. The following features have been declared nature memorials: mountain Krasnaja, lake Lebed', Lake Chaika, Mountain Shifer, heron colony, wetland Svinoe (Šventliūnio)
 - Controlled protection zone (buffer zone) - 31%.
 - Recreational zone - 15%. It consists of 4 regions: settlement Lesnoje, tourist campground “Duny”, settlements Rybachyi and Morskoje;
- The precise observance of the regime of the 1-kilometre protection zone;
- Calculation, standardisation and regulation of the recreational load in the National Park;
- Distribution of the recreational institutions, service centres and other types of constructions in the limits of the territorial reserves of the National Park settlements. Development of basic tourist infrastructure outside the NP.
- Reconstruction of the existing rest houses with the aim of minimisation of harmful waste generation and discharges from the heating systems, as well as to strive for the complete treatment of wastewater. Reduction of the holiday-makers number in the tourist hostel “Diuny” and the profile change of the hostel into the recreational institute of a family holiday hotel type. This principle is implemented through leasing agreements, which specify environmental restrains as individual items of these agreements. The limitations are compensated by taxation privileges.
- Restoration of the plots, disturbed by intensive anthropogenic activity;
- Comprehensive improvement of settlements and of the areas with regulated recreational use. Improvement of pedestrian excursion routes (ecological paths) and of the observation grounds;
- Forecast of the ecological situation in the region with the aim of preventing the projects and measures outside the National Park area, that can produce unfavourable reflection on the environmental situation on the Curonian Spit (for example, oil-extraction on the shelf in the region of the Curonian Spit).

k) Staffing levels (1998)

The Lithuanian part of the National Park:

- 71 employees, including:

- professional 18;
- technical 28;
- maintenance 25.

The Russian part of the National Park:

- 108 employees, including:

- Management staff – 18 persons;
- Forestry staff – 23 persons;
- Customer service (for visitors) – 1 person;
- Forest protection- 28 persons.

5. Property Affecting Factors

a) Development Pressures

The scale of the economic activity on the Curonian Spit actually is not large and is connected mainly with the activities of fishing Kolkhoz “Truzhennik Moria” (Kolkhoz

Administration is situated in Rybachy settlement). Fishing takes place in the Curonian Lagoon, but the main volume falls to the Baltic Sea aquatory (outside the borders of the park buffer zone) and the Atlantic.

Other able-bodied population is employed in the National Park, recreational institutions, services (trade, social and cultural institutions, health services, etc.).

Unfavourable influence on the natural complexes is produced by the recreational load often exceeding the set norms in the vicinity of recreational units and by a number of anthropogenic pollutants:

- sound pollution and pollution by emissions of fuel combustion, especially over last decades. The transit automobile road Kaliningrad-Nida-Klaipėda that divides the narrow natural-territorial complexes of the Spit is the source of contamination. In the strip of land adjacent to the road about 250 m on both sides, the lead concentration grew by 1,4-2,2 times over the period of 1990-1992. The considerable number of small animals and birds are killed under the car wheels;
- sewage, because about 80 per cent of wastewater is discharged without biologic treatment;
- the products of the hard fuel combustion, including the slag produced by primitive heating systems.

b) Environmental Pressures

The sea waters and air of the Curonian Spit are not polluted.

The oxygen conditions in the Curonian Lagoon are good; in some places excessive oxygen saturation of water is noted. The amount of dissolved pollutants (phenols, lignosulphanic acids, oil products), measured in mg/l, is negligible and remains within the limits of admissible standards.

The main portion of contamination is introduced into the Northern part of the Lagoon by Neman river. In the limits of Kaliningrad Region several small local sewage systems discharge their wastewater into the lagoon.

The dispersion conditions of harmful substances on the spit area are related to a zone with low potential of atmospheric pollution due to the climatic conditions.

Construction of dams in Kaliningrad Region changed the intensity of accumulation processes in the Curonian Spit. Smaller amount of sand is brought along the seacoast, and consecutively smaller amount of sand is accumulated on the Curonian Spit. In some segments even water erosion processes can be observed.

More than 70% of the Curonian Spit is covered by vegetation, sand brought from the Sea can not freely travel across the Curonian Spit. It means that moving dunes do not receive additional amount of sand, and due to wind erosion they become lower.

The main danger is the lack of reliable power and gas supply. That leads to growing share of hard-fuel (mainly coal) used by energy-heating installations and accordingly to increase of sulphur, nitrogen and carbon-containing substances levels in the atmosphere.

A little bit mitigating circumstance is that all the settlements and heating installations accordingly are located on the Eastern part of the Spit. That is why the harmful substances do not reach the Spit territory and are blown with the wind towards the Lagoon aquatory.

c) Natural Disasters and Preparedness

One of the most serious problems of the National Park territory is represented by the destructive impact of extremely powerful storms. Over the last 16 years 13 cases of the latter natural phenomena have been observed.

The breaching of the avant-dune, outwashing of the coastal strip, damage to the plantings are the results of the stormy winds influence. Thus during the last 35 years in Lesnoje and Morskoje settlements about 130 m of the coastal strip together with the situated there dunes have been washed out. There were cases of the total breaching of the spit territory, accompanied by

further long-term swamping conditions and unfavourable conditions for forest growth.

The main measures for preventing negative influence of the indicated disasters is the strengthening of the coastal bank (sand build-up, grass cultivation, reinforcement by artificial means, etc).

d) Visitor/Tourism Pressures

The average rated lump-sum park (Russian and Lithuanian parts) recreational capacity is 20 000 persons per day. Actually the number of visits in summer period constitutes in average over 9700 persons per day in the Lithuanian part and around 2300 persons per day in the Russian part (as a maximum).

The annual flow of the holidaymakers in 1996 was 1. 150 000 persons; in 1997 it was - 1. 500 000 persons, in 1998 – 1. 600 000 persons.

Thus the recreational load to the object as an average is less than the permissible standard; though in summer time, especially near the recreational facilities, it often considerably exceeds the permissible level. For the reduction of the pressure exerted on the environment due to the recreational use, the National Park carries out the complex of measures that includes:

- organisation of the regulated excursion service;
- creation of passes, crossings, bridges; reinforcement of the weak grounds;
- temporary prohibition for visitation of some areas because of the signs of the begun degradation of the topsoil.

Public is fully aware of the Curonian Spit status as that of a National Park. All visitors have to buy passes, which contain instructions for behaviour in the protected area and information about valuable objects and landscape complexes. Also, there are information signs posted within the territory of the park.

e) Number of Inhabitants within Property

On the Russian part there are three settlements within the National Park territory with the following population: Lesnoje settlement – 470 residents (recreational facilities – for 1,640 places); Rybachyi settlement – 905 residents (camp ground for 50 places); Morskoje settlement - 150 residents (recreational facilities for 100 places).

Population density – 4,8 persons per square kilometre.

Total able-bodied population accounts for 750 persons. In Morskoje and Rybachyi settlements part of the population employ in the military unit, situated on the Curonian Spit; nearly 150 persons are engaged in the “Truzhennik moria” kolkhoz. In Lesnoje settlement the able-bodied population work in tourist hostels, holiday homes and partially in the National Park. The largest part of the settlement population commutes to work in Zelenogradsk city.

Only several thousand people live on the Lithuanian part of the Spit. The last census took place in 1989 and in 1991. At that time, 2. 454, and 2.530 people respectively lived there (1.63 th. in Nida, 0.2 th. in Preila, 0.04 th. in Pervalka, and 0.66 in Juodkrantė). In 1994 more than 2. 600 people used to live on the Curonian Spit. Currently, the number of the National Park residents accounts for 2. 790 persons.

No activity potentially harmful for the National Park natural environment has been noted.

6. Monitoring

a) Key Indicators for Measuring State of Conservation

The territorial monitoring is conducted on the next parameters:

- forestry stock data (simultaneous stock taking once in 5 years and annual stock taking for individual alternating parameters) allowing to see the dynamic of changes occurring:
 - forest lands (ha);
 - species composition (average formula of forest vegetation);

- artificial plantings (ha);
- grounds, uncovered with forest vegetation (ha);
- lands other than forests (haylands, pastures, wetlands, sands, buildings, etc.) (ha);
- forest age structure (years).
- monitoring of dune dynamics (area, height, vegetation cover, etc.), coast line and beach development, air quality (samples);
- taking account of ungulate numbers (density per unit of area by species);
- taking account of avifauna (migrating and nesting residents by species)
- forest pathology monitoring (numbers of entomological pests, determination of the outbreak and attenuation thresholds, etc.)
- monitoring of natural resources.

b) Administrative Arrangements for Monitoring Property

All kinds of monitoring in the Lithuanian part are taken care of by various institutions. Vilnius University monitors development of dunes, Institute of Geography monitors coastal line and beaches, Agricultural University, Laboratory of Forests Monitoring monitors forests, Institute of Physics monitors air quality (long range transboundary pollution), and the State Museum of Zoology organises monitoring of bird migration in the Curonian Spit.

Monitoring in the Russian part of the Spit:

Type of monitoring	Areas and observation points	Type of observation	Frequency, time	Number of stations	Executor (department)
Forest-pathologic	Plantings	Feromonic traps	Spring, summer		NP
Calculation of the hoofed animals	Plantings	Driving, with the use of excrement's	Winter		NP
Monitoring of avifauna	Rybachy, 23	Catching with the net	Spring, autumn	2	Biostation ZI RAN
Meteorological	Rybachy, museum	Instrumental	Constantly	2	OI RAN
Water resources	Gulf	Instrumental	Spring, summer, autumn	1	ATLANT NIRO

1. Forest pathology monitoring in the National Park has been carried out annually since 1991. The executor is the Association Ltd. STC "Lesnaia Energetika" attached to VNIILM LH, Pushkino.

The main aim of monitoring is the forecast of the forest pathology situation, of its changes as well as the determining of forest-protective measures and evaluation of their efficiency. The calculation should be made for silkworms, the complex of pine-trunk pests, the root fungi of pine and spruce. The monitoring objects are the most valuable parts of pine, spruce and birch plantings.

2. Biological station, ZIN RAN.

Conducts the monitoring of the avifauna since 1956.

The aim is the research of a role of different bird species in the regulation of number of the mass forest stand pests on the Curonian Spit of the Baltic Sea, the research of the structure and the number of the main species of nesting and migrating birds.

3. Institute of Oceanology named after Shirshov, RAN. Conducts the meteorological monitoring on the Curonian Spit.

4. ATLANT NIRO. Conducts the instrumental monitoring of the water resources of the Curonian Lagoon since 1997.

5. The NP specialists perform:
- account of the ungulates using the method of crossing of their daily traces.
 - phenologic observations of the tree-brush vegetation of the Curonian Spit.

c) Results of Previous Reporting Exercises

The Curonian Spit has 40 years old traditions of integrated scientific investigations. Integrated identification of landscape regions is prepared. This allows for comparing changes in the Curonian Spit landscape caused by natural development or environmental impact during different periods of time.

The history of natural processes and human activity interaction was observed and registered during the last several hundred years. Important works on development of geomorphic features, evolution of natural communities exist.

7. Documentation

a) Photos, slides

The selection of diapositives included in the documents' package show all the main natural complexes of the "Kurshskaja Kosa" NP in different seasons of the year.

Attached authorisation – see attachment 5.

b) Copies of Property management Plans and Extracts from other Documents

Attachment 2.

- 2.1 Abstract from the Law on Protected Areas of the Republic of Lithuania
- 2.2 Some articles from the "Law of Russian Federation about the Specially Protected Areas"
- 2.3 Letters of recommendation
- 2.4 Decrees and Resolutions
 - 2.4.1 Decision of the Supreme Council of the Republic of Lithuania "On the establishment of the Dzūkija, Kuršių Nerija, Žemaitija national parks, Trakai historical National Park and Viešvilė State Strict Reserve";
 - 2.4.2 Decision of the Government of the Republic of Lithuania "On approval of planning scheme of the National Park Kuršių Nerija"
 - 2.4.3 Decision of the Government of the Republic of Lithuania "On adoption of Provision on the National Park Kuršių Nerija"
 - 2.4.4 Decree of Council of Ministers of the RSFSR "About the foundation of a State Natural National Park "Kurshskaja Kosa"
 - 2.4.5 Order of Ministry of Forestry of the RSFSR "About the Foundation of the State Natural National Park "Kurshskaja Kosa"
 - 2.4.6 Decision of Kaliningrad Regional Council of the Peoples Deputies Executive Committee "About the Foundation of the State Natural National Park "Kurshskaja Kosa"
 - 2.4.7 Decree of Kaliningrad Forestry Department "About the Foundation of the State Natural National Park "Kurshskaja Kosa"
 - 2.4.8 Letter of Administration of Culture of the Kaliningrad Regional Executive Committee "About Conservation and Use of the Monuments of History and Culture of Kurshskaja Kosa"
- 2.5 The NP Regulations
- 2.6 NP "Kurshskaja Kosa" Management Plan
- 2.7 NP "Kuršių Nerija" Management Plan

c) Bibliography

In the attachment 3 there are more than 30 of the most considerable publications about the Curonian Spit largely published over the last 10 years.

d) Address where Inventory, Records and Archives are held

Russian Federation
Federal Forestry Service
Moscow, 113184
Piatnitskaia St. 59/19

Forest Administration of the
Kaliningrad Region
Kaliningrad, 236007
Sovetsky prospect, 13

NP Administration
Kaliningrad Region
Zelenogradsk District
pos. Ribachy
Lesnaia St., 7

Nature and History Museum:

Smiltyne 11
5800 Klaipėda
Lithuania
tel: (370) 6 391179

The Curonian Spit National Park Administration:

Smiltynė 18
5800 Klaipėda
Lithuania
tel: (370) 6 391109

e) Attachment 4. Lists of Plants and Animals. Description of cultural value.

4.1 Select list of rare, endemic and relic plants of the Curonian Spit.

4.2 List of rare and protected species of the vertebrates noted on the Curonian Spit.

On behalf of the Russian Federation:

**Chairman of the State Committee of the
Russian federation for Environmental
Protection**

Viktor I. Danilov-Daniljan

On behalf of the Republic of Lithuania:

**Minister of Environment of the
Republic of Lithuania**

Danius Lygis