



Forest & Nature in Northwest Russia

FINNISH-RUSSIAN DEVELOPMENT PROGRAMME ON SUSTAINABLE FOREST MANAGEMENT AND CONSERVATION OF BIOLOGICAL DIVERSITY IN NORTHWEST RUSSIA

Second Phase (NWRDP II) for 2001-2004)

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Foreword

You are now reading the third electronic bulletin of the Finnish-Russian Development Programme on Sustainable Forest Management and Conservation of Biological Diversity in Northwest Russia (NWRDP). With this issue we would like to present to you some of the proceedings and activities of the sustainable forestry and nature protection projects in 2002.

The second phase of the Programme started almost three years ago. Since then, more than ten forestry and almost twenty biodiversity conservation projects have been launched in Northwest Russia. In many cases bilateral activities have broadened towards wider multilateral cooperation.

2004 will be the last year of the execution of second phase of the Programme. What does this mean in practice? Obviously, even after 2004 there will still be a mutual will and need for cooperation in the forest sector between our countries.

While there are still almost twenty projects going on under the umbrella of the Programme, it might be a little too early to sum up all the experiences and lessons learnt. However, a lot of attention has been focused on the continuation of the joint activities in the Programme framework.

So far it has been decided that the forestry component of the Programme should pay more attention to the development of forest sector education and training, and consequently, to the training of forest sector specialists in Northwest Russia. A Finnish-Russian consortium, responsible for carrying out the planning of the training activities of the third phase of the forestry component, has already been selected and the work has been started. Similar process has been started in order to evaluate the previous activities, and particularly, to outline the main goals and activities for the biodiversity conservation component for the future.

Experience has shown that foreign input can only provide ideas and operation models to be considered, while decisions must be made in situ by locals. This also means that the goals and activities of the international forest sector cooperation will be determined by the development processes going on in Russia right now, the most important of which is the new forest code. In order to secure the sustainability of the results achieved by the joint projects, objectives of cooperation must support those determined by the Russians themselves.

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The Finnish coordination group of the Programme would like to thank all Russian, Nordic and other international partners and friends for good cooperation in 2003 and wish you a Merry Christmas and All the Best for the Year 2004!

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Nature Protection Projects

Nature Protection Areas of Saint Petersburg



The natural surroundings within which the city of Saint Petersburg was established and has grown have changed irreversibly during the 300 years of the existence of the city. But even today natural landscapes can be found within the city boundaries. Some of these territories with valuable natural complexes have been given the status of nature protection areas (NPA).

There are six NPAs within the territory of Saint Petersburg, two of which have the status of zakazniks and four are nature monuments. Each of them contains valuable nature complexes, and they also have a rich history. The nature monuments of Sergiyevka Park and the Duderhoff hills are included in the UNESCO World Heritage List as part of the historic centre of Saint Petersburg and the related area.

The history of establishing NPAs in Saint Petersburg dates back to the 1920s, when the idea of creating the Lahtinskiy Nature Reserve in the northern part of Petrograd (as the city was called at that time) came up. This idea was realized in 1991, when the City Council decided to establish the Yuntolovski zakaznik in this area.

The Yuntolovski zakaznik is situated at the north coast of the Neva Bay within the Lahtinskiy lowland in the very vicinity of the city with an area of 976 800 ha. Lake Lahtinskiy razliv, which is formed by an estuary bay, is the main landscape-forming complex of the zakaznik. The south-southeast part of the lake, which is connected with the Gulf of Finland through a narrow channel, is covered by thick growths of reed and other aquatic flora, and elements of seaside marches can still be found at the shores. The mire Lahtinskoye boloto is situated to the north of Lake Lahtinskiy razliv between the rivers Yuntolovka and Kamenka. It is the largest protected mire in Europe within the limits of a large city with millions of inhabitants. Sweet gale covers large areas. This plant exists here at the northeast limit of its distribution area, and it has been included in the Red Data Book of Russia. The forests are mainly paludified, and birch and pine are the prevailing species.

Lahta is one of the most ancient coastal settlements at the Gulf of Finland, and it existed here long before Saint Petersburg was founded. This name can be found on ancient maps dating back to the beginning of the 18th century. Lahta and its surroundings belonged to the family of counts Stenbok-Fermor from 1860. After the Primorsk railway was built on the coast of the Gulf of Finland, the Lahta region started to develop as a holiday resort. An Excursion Station and a Neva Bay Coastal Nature Museum lead by professor Wittenburg functioned in the Stenbok-Fermor palace from 1919 to 1932. The museum was visited by almost 13 000 people every year. The Lahtinskaya Station played an important role in studying the whole coastal area of the Neva Bay, and it even published a handbook on this region.

From time immemorial the Lahtinskaya lowlands with the adjacent sandbanks of the Gulf of Finland have served as a resting place for migrating birds using the White Sea – Baltic Sea route, which is the largest bird migration path in Europe with vast shallow water areas, thick reed growths and coastal sandbanks, and every spring and autumn up to 2 millions birds – mostly waterbirds – stop here. When the Lahtinskiy Nature Reserve was being established in the first years of the Soviet regime, the following grounds were given: “In the lower part of the River Kamenka and along its large estuary one can observe primitive and therefore valuable, and, at the same time, very rich combination of plant forms, which cannot be found in any other place of the Petrograd lands. Here, in the very vicinity of the town, not only beautiful and edifying scenes of primary flora of this

region can be seen, but also typical representatives of our northern fauna, such as elk, capercaillie, hazel grouse, white ptarmigan and heath-cock can be caught in their natural environment”.

Some decades later the famous ornithologist A.S. Maltshchanskiy wrote: “We should bear in mind that for several centuries Lahta has been an important transit path and a resting and feeding place for thousands of birds living on water bodies and wetlands. In our days, when the ornithofauna is catastrophically decreasing in the whole world, preservation of the natural conditions and strict protection of the birds in this coastal area are of national importance”.

However, already then the general development plan of Leningrad envisaged filling in the coastal zone with sand to build a new enormous district with many-storied buildings, which now is part of the city marine façade. These gigantic constructions lead to fundamental changes in the nature of the coastal areas. The Krestovskaya and Sobakina sandbanks, which were the most important bird resting places, were destroyed, and the removed soil was used to fill in the coastal marches. This put an end to most natural complexes, which had so much ravished the former naturalists. Nevertheless, some landscape forms typical of coastal plains of the past have survived in the relatively small area of the Yuntolovskiy zakaznik, and they exist in their natural condition even today.

A rare salmon – pearl mussel biosystem has been preserved in the south of the Karelian Peninsula in the basin of the River Gladyshevka. 90 % of the freshwater pearl mussel stock can be found in the Arhangelsk Region. There are only 4 or 5 rivers left in the Leningrad Region with fish of the Salmonidae family and European pearl mussel. This is the only place where they share a habitat on the Karelian Peninsula. The **Gladyshevskiy zakaznik** protection area was established in order to conserve this biosystem and more than 30 other rare species of flora and fauna. It is situated in the territory of two Russian Federation Regions: in the Vyborg District of the Leningrad Region and the Kurortniy District of Saint Petersburg. It was established in 1996 with the aim of conserving the populations of the European pearl mussel and Salmonidae fishes with a total area of 8 419 ha, 765 ha of which are situated within the administrative territory of Saint Petersburg.

Coniferous species prevail in the forests of the Gladyshevskiy NPA. Pine forests with a significant share of young stands cover 40 % of the River Gladyshevka basin. Spruce forests cover 30 % of the territory, and they play an important role in environmental formation and water protection. Deciduous forests consisting mainly of birch and aspen have appeared in felled areas.

The water system of the Gladyshevskiy NPA consists of the Rivers Velikaya, Gladyshevka, Roshinka and Tshornaya, Lake Gladyshevskoye and the area slightly upstream of the mouth of the Gulf of Finland. The diversity of hydrobiont community is determined by these varying natural conditions. The fish population includes 25 species from 9 families and the lamprey. The greatest diversity can be found in the saline waters slightly upstream of the mouth of the Gulf, where 26 species from 10 families can be found. At the change of seasons typical freshwater fish species (whitefish, vendace, pike, dace, ide, roach, bleak, bream, blicke, ziece, gudgeon, crucian, pikeperch, perch, ruff) are replaced by half-migrating (trout and smelt) and marine species (sprat and stickleback).

The lowest fish population diversity can be found in the rivers, especially in the midstream and upstream stretches. Species of six families inhabit Lake Gladyshevskoye: Salmonidae (trouts), Osmeridae (lake smelt), Esocidae, Cyprinidae (dace, ide, roach, bleak, bream, blicke), Gadidae (burbot), Percidae (pikeperch, perch, ruff). The vicinity of such an enormous city as Saint Petersburg affects not only the state of the waterbodies, but also the fish resources. Non-regulated free-time fishing has led to a significant deterioration of most fish populations and to a complete extinction of reproducing salmonids in the rivers of the Gladyshevskiy NPA. Measures to restore different fish species are carried out on a regular basis.

The City Council made a decision in 1992 to establish four nature monuments. **The Sergyevka Park** is an estate in the westernmost part of the Petergof Palace area. It is an ancient landscape park, which used to belong the Naryshkin family. At the beginning of the 19th century it was one of the beautiful parks of this region with lovely palaces and auxiliary buildings in the middle of age-old pines, spruces and oaks, decorated with numerous sculptures and fountains. Emperor Nikolay I bought the estate in 1839 from the Naryshkin descendants and gave it as a present to his daughter Maria before her marriage to Duke Maximilian Leichtenbergskiy. The palace and the other buildings of the Sergyevskoye Estate were designed by architect Schtackenschneider, and the park was constructed under the supervision of Park Master Pyotr Ivanovitsh Erler.

The total area of the park is 103 ha, and it is situated on two coastal terraces at the Gulf of Finland. The largest part of the park lies on the upper terrace at a relative altitude of 15–20 m above sea level. The northern part of the terrace ends in a steep ledge about 8–10 m high. Underneath the ledge opens the coastal lowland, which at a distance of 400 or 500 m smoothly congregates with the waters of the Gulf. There are many artificial ponds in the park (they cover approximately 4 ha altogether). Two deep gullies pass through the western and eastern parts of the upper terrace; they are the washed-out valleys of the Kristateleviy brook passing through the park from the south to the north. On the slope of the eastern gully there is a boulder of 4 m in diameter left here by the glacier, and an unknown sculptor has carved a human face on it.

The park is situated in the north-south direction on a 2-km stretch perpendicular with the coastline. On this stretch there are regularly alternating shallow water areas of the Gulf, thick growths of reed along the shoreline, a coastal lowland mire, shoreline marches growing black alder, mixed forests with broad-leaved trees on the lower coastal terrace, forests of broad-leaved trees on the slopes of the ledge and in the areas adjacent to the upper terrace, mixed forests with a great number of birches and also some broad-leaved trees, mixed stands with spruce and broad-leaved trees and plain spruce stands in the southern part of the park. The structure of the broad-leaved stands is very complex. The first layer of the lower terrace consists of linden, maple, ash, black alder and single pines and spruces. Oak, linden, maple, spruce, speckled and black alder and bird cherry trees prevail on the coastal slope and on the gully slopes. Lungwort, corydalis and Yellow-Star-of-Bethlehem, as well as other oak-forest species are typical in the herb layer of broad-leaved forests. Forests with broad-leaved species and a mosaic-like landscape create a great diversity of flora and fauna with a substantial share of rare species.

The estate was given over to Petrograd University in 1919, and the laboratories of the Biological Institute of the University were located in the former palace. The palace was bombed and destroyed during the 2nd world war, the park vegetation suffered severely and up to 60 % of the woods were lost. After the war the park was restored and the palace building reconstructed, and nowadays the Biological Institute of the University is located there again. Nature monitoring has been carried out in the park for 80 years including surveys on changes in the ecosystems caused by human interference. A huge residential area has been built next to the park during the last few decades, and the number of visitors and, consequently, also the anthropogenic load have grown to a large extent, which naturally affects, among others, the number and structure of bird populations nesting in the park area. Still, even under high anthropogenic pressure, this territory has a remarkably high diversity of species.

Strelninskiy bereg, which is another nature monument, is situated at the southern shore of the Neva Bay in Strelna village. Here, at a distance of 19 versts from the northern capital of the empire, Peter the Great planned to erect his grand summer residence. At his command the deserted and paludified coast was turned into a flowering corner with a gallery of country palaces and parks. The natural complexes, the remainders of which are nowadays protected within the nature monument,

disappeared almost completely because of the dynamic activity and vigorous transformations at the coast of the Gulf of Finland.

Those who built the first country estates successfully used the unusual coastal relief: the palaces were built on the high coastal terrace, which abruptly falls towards the sea, and the paludified areas (marches) between the terrace line and the sea were drained and orchards and parks of regular form were established there. In 1797 Emperor Paul I awarded Strelna to his son, Grand Duke Konstantin Pavlovitsh, after whom the famous Konstantinovskiy Palace was named. The eastern side of the palace territory is bordered by a channel, which at the same time serves as the western boundary of the nature monument.

The Strelninskiy bereg nature monument (NM) is an etalon of coastal marches with black alder thickets, which practically disappeared after the southeast part of the Gulf of Finland was built up and started to be used as a holiday resort. The NM covers an area of 53 ha and it is situated on a relatively homogeneous paludified Litorine terrace. The vegetation consists of three main types of flora communities: thickets of reed and bulrush, willow and black alder. The black alder thicket is one of the largest within the city limits. The undergrowth includes broad-leaved species with a relatively rich herb layer. The flora of higher vascular plants includes approximately 300 species. Fragments of *Cladophora glomerata* thickets can be found in shallow water areas of the NM, and they play an important role in the ecosystem, as they provide feed for the phytophages and a habitat for many invertebrates. The coastal sandbanks and the littoral zone serve as a resting place for water birds during the migration period. Perching birds actively use the wood and brush layer growths to seek food for their offspring. Among predators the rough-legged hawk and the goshawk can be seen here from time to time, but the territory is too small for them to nest or to hunt on a regular basis. Mice-like rodents and insectivores (shrews and moles) are the prevailing mammals, and foxes, snow hares, muskrats and minks appear periodically.

To the south of the coastal lowlands of the Gulf of Finland, where Sergyevka Park and the Strelninskiy bereg Nature Monuments are situated, at a distance of 20 km to the southwest of Saint Petersburg there is an elevated plateau called the Siluriyskoye or the Izhorskoye Plateau. The top of the Plateau is mostly flat and has only a few low hills. The highest area is located in the northern part of the Plateau with the **Dudergofskaya heights** and Mt. Orehovaya, which is the highest point and rises 176 m above the sea level. Mt. Voronya is located to the north of Mt. Orehovaya. The Duderhofskoye vysoty Nature Monument is situated in this mountainous area.

The Dudergofskaya estate in the former Ingermanland region belonged to Katherine I, who was Peter the Great's wife and later on became Empress of Russia. At her command a herbarium of 495 plant species was collected of the plants growing in Dudergof surroundings, which tells about the value and exclusivity of the local vegetation. The park was created on the basis of the natural dark coniferous stands, which were only slightly altered through landscape fellings, and some decorative plantings were made in order to add diversity to the landscape. For many years the Guards conducted their summer camps in the Dudergofskaya heights. It can actually be said that the destiny and the appearance of the nature monument as it is today were in the end defined by army operations.

The natural forest vegetation of the Dudergofskaya heights was wiped out during the 2nd world war and the defence of Leningrad. The most valuable trees were cut off, and the rest were seriously injured, which almost led to a complete destruction of the park forests. The last forest inventory had been carried out in 1937, and ten years later only one tenth of the coniferous trees were left and the overall percentage of preserved trees was less than 20 %. Nevertheless, the destruction of the canopy layer had a positive impact on the undergrowth consisting of hazel, rowan, elder and decorative bushes, which spread intensively, and ashes, maples, oaks, elms and lindens started to

reproduce. Nowadays Mt. Voronya grows maple and ash-tree forests, and on the western slope of Mt. Orehovaya there are even oak stands and a small spot of spruces. A few 100–150 year-old pines and lindens remain in the park. The lady's slipper, which is included in the Red Data Book of Russia, can also be found in the park. As a whole, the vegetation of the Dudergofskaya heights formed on calcareous soil is rather more typical of the southern regions of Russia, than of the surroundings of our northern capital.

The Komarovskiy bereg Nature Monument (NP) with an area of ca. 180 ha is located at the north coast of the Gulf of Finland on the famous holiday resort area between Zelenogorsk and Sestroretsk towns. Kellomäki village, which is nowadays called Komarovo, started to be formed here in the 1880s. The rise of Kellomäki village was directly related with the “summer cottage boom” at the turn of the 19th and 20th centuries after the Riihimäki – Saint Petersburg railway was built in 1870. A small area typical of the Karelian Peninsula taiga landscapes has miraculously remained intact in the middle of intensive construction of summerhouses.

The most part of the NP is located within a littoral terrace limited by the Gulf of Finland on the one side and by a slope called Litorine ledge on the other side. The upper part of the slope is steep and it grows mostly pines with a field layer of lilies of the valley. Many ground-water springs and brooks can be found in the central and lower parts of the slope, and a thick dark green spruce grove with many pissant nests even 1.5 m high has been preserved. The terrace is covered by shamrock, fern and peat moss type spruce groves. Birch and black alder forests grow on areas once cultivated. Some picturesque gullies with steep slopes and brooks cut through the upper terrace. Sea rocket, beach pea, sea sandwort, lyme grass, sandstarr and sand fescue are typical plants of the coastal zone habitats at the Gulf of Finland with low sand dunes and sandy beaches scattered with boulders. Rugosa rose is another typical plant. Arboreal vegetation is very scarce on the dunes and it consists mainly of undersized pines.

The fauna of this territory is typical of the southern taiga subzone. The most plentiful and diverse fauna can be found in secondary mixed forests and deserted gardens with species typical of both southern taiga and mid-taiga areas (common frog, willow warbler, bank vole and squirrel) and nemoral forests (blackbird and woodpigeon). Not only wood nesting birds are typical of this area, but also shrub and ground nesting species can be encountered. The variety of species is very small although the density of inhabitants may in some cases be rather high. Squirrel, bank vole, mole and common and pygmy shrew are the most widespread mammals. Yellow-necked mouse, snow hare and ermine are less frequent, and large mammals can be seen occasionally. The following widespread vertebrates can be seen in spruce groves: shrews, squirrel, siskin, goldcrest, chiffchaff, crossbills, blackbird and robin. Sparrowhawk, goshawk and honey buzzard are common predator birds.

In spite of signs of anthropogenic impact can be clearly seen in the whole territory of the Komarovskiy bereg Nature Monument, and the fact that it is scattered with walks and paths and a road with intense traffic passing through it, the atmosphere of an almost uninhabited Finnish coast can still be felt there.

The overall territory of nature conservation areas with zakaznik of nature monument status is 2 146 ha, which is slightly more than 1 % of the total city area. The existing network of nature protecting areas does not completely solve the problems connected with biodiversity conservation. The protection of natural complexes in the coastal zone of the Neva Bay, forest and mire ecosystems and some unique sites is one of the problems we are facing today. There are also numerous parks, estates and other nature ensembles within the present-day city limits. They have been created in compliance with the existing natural complexes during the 300-year history of Saint Petersburg, and they have maintained their uniqueness to our days. Surveys on the present state of these territories

and giving them the status of conservation areas are the most important present-day tasks to further develop the network of nature protection areas.

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Gogland Island (Suursaari)



Gogland Island is situated almost at the Russian-Finnish border. It stretches from north to south, and it is 11 km long with a maximum width of 3 km. Situated near the territorial waters of several states, it has a history rich in different and sometimes tragic events. Initially the island belonged to Sweden and was called Högland. It became Russian territory after Russia won the famous Gogland battle and made peace with Sweden in 1743.

The island became known worldwide thanks to the scientific inventions of A.S. Popov, when at the end of January 1900 the first wireless telegraph connection was set up between Gogland Island and Finnish Kuutsalo Island near Kotka town. A stele and a memorial plate have been mounted in the place where the first radio transmitter stood to honour this invention.

A monument has been erected not far from Suurkylänlahti Bay in honour of the first measuring of the meridian conducted on the island in 1856 under the surveillance of professor Struve. Pulkovo Observatory established the astronomical mark of Gogland Z at the end of the last century.

Gogland Island belonged to Finland starting from 1917. There were two Finnish villages on the island called Kiiskinkylä and Suurkylä with a few thousands of inhabitants, most of whom earned their living from fishery and seal hunting. Solid foundations of the dwellings, stone fences, neat tilled plots and other signs of peaceful life of the past can still be seen in the places of the former villages. After the Soviet-Finnish war, according to the conditions of the peace treaty signed in 1940, Gogland Island became Soviet territory. Dramatic events took place near the island during the 2nd world war. In August 1941 ships with refugees – children and women – were trying to flee from besieged Tallin to Kronshtadt, but they were destroyed by the German air force. During the following years of war, Soviet, Finnish and German forces lead fierce battles on the island, and it is difficult to estimate the total number of people who were killed here. After the war, coastal defence installations were erected on the island, and later on a powerful air defence radar station was set up, which has now been dismantled. Nowadays there is only a small coast guard post on the island, and the Navigation Service personnel serving the northern and the southern Gogland lighthouses are the only inhabitants of today.

Hopefully a totally new era is beginning for the dramatic faith of Gogland Island. The picturesque nature and the convenient location at the crossing of Baltic waterways have given cause to the idea of establishing an international tourist centre on the island. The present project plan envisages the construction of a harbour for small vessels and facilities for underwater diving, underwater archaeology and recreation at the water both in the summer and in the winter. The plan also includes setting up a frontier and customs terminal and the reconstruction of a Finnish village. Once the tourism infrastructure is complete, the centre will be able to host tens of thousands of tourists yearly.

At the same time it is necessary to keep in mind the extreme vulnerability of the nature complexes of the island. Careless behaviour already lead to a massive fire in August 1997, and a large forest area in the northeast part of the island was destroyed. Traces of the fire can be seen both near the Lake Tretye ozero and the southern lighthouse.

The increasing load on the environment caused by tourism may lead to the degradation or even the complete destruction of nature complexes. This is why it is necessary to set up specific regulations on nature use in certain areas of the island in order to control the recreational pressure by establishing a complex nature conservation area subordinate to the regional administration with a zakaznik status.

The present state of the environment of Gogland Island was surveyed at the order of the Finnish Environmental Institute in the summer and autumn 2003. The survey was aimed at defining the unique nature objects of the island to be included in the future nature protection area (NPA) and to determine its boundaries. A working group was set up consisting of specialists from different scientific institutes in Saint Petersburg: the Biological Institute of Saint Petersburg University, the Botanical Institute of the Russian Academy of Science, VSEGEI and the Severkvartssamotsvety Company. Many experts have been working on Gogland Island also during the previous years, and they have gathered an ample amount of scientific data. The work was coordinated by the Biological Institute of Saint Petersburg University under the thematic guidance of Professor G.A. Noskov.

The survey showed that geology is the most valuable feature of Gogland Island. Detailed geological descriptions of the island have been made by Swedish and Finnish scientists at the end of the 19th and at the beginning of the 20th centuries: E. Hoffman, J. Lemberg, W. Ramsay etc. Most parts of Gogland were surveyed in 2002–2003. Crevice maps have been drawn up, the most interesting mineralogical massifs have been described and a large gemmological collection has been made.

The first descriptions of the unique Gogland flora were made by A. Shrenk and Karl von Baer in the middle of the 19th century. Later on until 1939 mainly Finnish botanists worked on the island. Florists from the Natural History Museum of Helsinki University visited Gogland in the 1990s, and after that Russian botanists have come here from time to time. Y. Glazkova, Researcher of the Komarov Botanical Institute of the Russian Academy of Science, worked on Gogland during a few field seasons. As a result of these activities, 648 plant species were registered, among which approximately 100 can be considered rare, extremely rare or in need of special surveillance.

Detailed ornithological information about Gogland Island can be found in the survey of I. Välikangas published in 1937. Since then no ornithological surveys have been carried out. We gathered some data during our short-term stays on the island in 1993–1995. Data on species variety and the number of birds in the period after nesting and during autumn migration was collected in 2003. The surveys showed that Gogland Island plays an important role in the autumn migration process of birds. Most migrating land birds use it as a kind of a bridge between the north and the south coasts when crossing the Gulf of Finland. This concerns small perching birds, but also pigeons and predator birds. The migratory flow is very well expressed in relatively calm weather or at eastern winds. The birds arrive in Gogland from the north and northeast, pass the island keeping near to the coastline and then fly further in the southern direction most often through the southwest corner of the island. During storms and strong western winds, the migrants stop their journey to the south and land on the island. At those times very large numbers of birds gather here to feed, and also internal transference within the island can be observed.

The boundaries of the future zakaznik NPA have been defined in nature. The NPA will probably include the whole territory to the south of the path leading to Yagodnaya Bay, to the east of the central road and to the south of the path leading to Cape Limonnikova and to the west of the central road. The area of the southern Gogland lighthouse is to be excluded from the NPA.

Hence, the NPA will include geologically most interesting highlands, all 5 internal lakes of the island and the floristically unique area of former Kiiskinkylä village. A few nature paths passing through the most interesting sites should be organised for the tourists coming to the island, and texts telling about the nature should be prepared.

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The Present State of the Nature Conservation Areas in Murmansk Region



The history of the formation of nature protection areas (NPAs) dates back to the 1930s, when the Soviet Government made a decision to protect the forest reindeer and the common eider as species representing important “resources”, and the Laplandskiy and Kandalakshkiy Nature Reserves were established. In the 1980s a network of primarily hunting and fishery protection areas with a “zakaznik” status started to be organized. The main goal of these areas was to support and restore the hunting and fishery resources. The zakazniks were usually aimed at functioning as reproduction grounds for certain species. Consequently, in hunting zakazniks and also in some complex zakazniks even such destructive activities as final fellings were not prohibited, and this has resulted in the fact that large areas of these zakazniks have been cut through final fellings, which makes it impossible for many nature protection functions to be fulfilled.

The international Russian-Norwegian Pasvik Nature Reserve was established in 1993. At the end of this period, in 1994, Kolvitskiy and Kutsa Complex Zakazniks were set up, which was the most important achievement of this period, as the rules of these areas make it possible to fully protect all the components of nature.

In the 1980s 36 nature monuments were established by the decision of the Regional Executive Committee including 11 geological, 2 hydrological, 9 botanical and 2 historical monuments and also 2 test grounds.

Later on, at the initiative of the Regional and Central Councils of the All-Russian Nature Conservation Society, the following four regional nature monuments were transferred into the category of State nature monuments of the Republican level: the Zalezh Yubileynaya at Lovozero hills, the Astrofillite Hills Eveslogtshorr at Hibiny hills, the Epidosites on Cape Verhniy Navolok on the Tolstik peninsula in Kandalaksha bay, and Lake Ozero Mogilnoye on Kildin Island in the Barents Sea.

In 1986 fourteen more objects were declared to be nature monuments including 1 geological, 3 hydrological and 10 forest monuments. Since then the number of NPAs has increased, but also decreased, because some areas have lost their nature protection significance.

All nature monuments have been established to protect small objects, and 13 of them are plantations or sites where introduced species have been planted casually, the latter being interesting only from the forestry point of view. The areas of these nature monuments are not sufficient for the practical conservation of the objects within the monuments, and they can be only considered as additional elements of a representative NPA network.

The Government of Murmansk Region has decided to establish some new NPAs since 2000. The Varzugskiy and Ponoiskiy fishery zakazniks have been restored, the Simbozerskiy zakaznik has been established, land reservations have been made to establish the Laplandskiy les zakaznik, and a protection zone has been set up for the Pasvik Nature Reserve.

At present there are following nature protection areas in the Murmansk Region:

- Three nature reserves: Kandalakshkiy (70 527 ha), Laplandskiy (278 435 ha) and Pasvik (14 586 ha). The Laplandskiy Reserve has a protection zone of 27 998 ha, while that of the Pasvik Reserve covers 7 673 ha;

- 11 zakazniks with an overall area of 784 861 ha. Seven of them covering 350 993 ha have rules protecting them from the strongest nature-destructive impacts and guaranteeing the environmental protection functions. The Kanozerskiy, Murmanskiy tundroviy and Tulomskiy zakazniks belong to the category of federal NPA;
- 42 nature monuments with an overall area of 4 205 ha;
- The Polar Alpine Botanical Garden-Institute of the Kola Science Centre of the Russian Academy of Sciences encompasses a protected area of 1 380 ha;
- The Murmansk region has no national or nature parks.

The total area of NPAs is 1 154 112 ha, which covers 8.1 % of the region's territory. However, only 5.1 % of the protected areas consist of NPAs with rules protecting their nature from the most destructive impacts.

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Mires of Eastern Fennoscandia: Scientific Basis of Their Sustainable Use and Protection



Project participants from the Russian side: Institute of Biology of the Karelian Research Centre of the Russian Academy of Sciences (RAS). Participants from the Finnish side: Finnish Environment Institute, the Finnish side of the Friendship Park and the Geological Survey of Finland.

Mire ecosystems cover approximately 20 million ha of Eastern Fennoscandia with approximately 5.5 million ha in the Republic of Karelia in Russia and 10 million ha in Finland. The mires play an important role in the landscape structure and dynamics of this region and also in the hydrocarbon balance of the whole planet. This region is the habitat of many unique and rare plant and animal species and biotic communities, which support the biodiversity of nature. Large mire areas are already used for forestry and agricultural purposes, energy production, and tourism, and some mires have been protected. The mires are much more intensely used in Finland than in Karelia.

The mires of Karelia have been surveyed for 70 years, and a vast amount of information about their nature has been gathered in the Mire Ecosystem Laboratory of the Institute of Biology. A significant part of this information has been published. Extensive material has been collected about mire plants, stratigraphy and peat resources, as well as about the biology and resources of berries and medicinal plants. The laboratory has prepared printed mire vegetation maps based on aerial photography in the scales of 1:25 000 and 1:50 000. The different nature conservation areas of Karelia include approximately 130 000 ha of mires covering 3 % of their total area.

The economic and legislative changes that have taken place in Russia during the last few years concerning the ownership and use of natural resources have made it necessary to combine the information about the condition and resources of Karelian mires at a new methodological and technical level in order to elaborate strategies for their sustainable use and protection. A series of data bases and electronic maps on mire distribution and resources based on GIS-technology is being developed within the project. Satellite pictures are also used. Terrestrial mire ecosystem investigations are being carried out in some areas that have been less intensively surveyed.

A joint expedition was organised in August 2003 to Ypäyssuo (over 20 000 ha), the largest aapa mire in Fennoscandia. It has been recommended that this mire should be protected within an international wetland category. Further measures are being taken to enlarge the network of protected mires, and this material will serve as a basis for the GAP-analysis programme concerning the future network of protected areas of the Northwest territories of Russia. A collection of articles concerning the biodiversity and resources of mires in Karelia is being prepared for print. New data about the resources of peat, berries, medicinal plants and recreational potential of mires, as well as recommendations on their use, will be provided to the appropriate ministries and also to the Karelian Government. The Russian Ministry of Industry, Science and Technology has also given financial support to the project in 2003.

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The Ichthyofauna of the Vologda Region



The Vologda region is situated in the North-West of the European part of Russia (at 61° 36' – 58°21'N, 34°40' –47°10'E) within a transition zone from polar to temperate latitudes. The water bodies of the Vologda region are located on the watersheds of three seas and belong to the basins of the Caspian, the Baltic and the White Sea. There is a rich hydrological network with numerous rivers and small lakes, tree large shallow lakes Beloye (1284 km²), Kubenskoye (417 km²) and Vozhe (418 km²) and two artificial lakes (Sheksninskoye and a part of Rybinskoye). Part of Lake Onega also belongs to the Vologda region.

The formation of biota and ichthyofauna in this region was greatly affected by the pleistocene and post-pleistocene conditions. During that period the verge of the Valdayskiy Glacier passed through this area. The subsequent formation of the ichthyofauna was affected by global climate changes and gradual development of the current hydrographical network. Elements of Baltic and Arctic faunas appeared when the post-glacial lakes got connected with different marine basins. The isolation of the lakes for 10 000 years lead to the formation of land-locked and endemic forms of the whitefish family, including whitefishes and vendaces (Teleostei: Coregonidae).

Intermittent connections of lakes with the basins of the Caspian, Baltic and Whites Sea during the retreat of the glacier had a great impact on the fish distribution. The formation of the ichthyofauna was based on three main faunistic complexes, namely the boreal, arctic and ponto-caspian ones. Natural processes of freshwater ecosystem evolution normally occur under the influence of climatic changes during hundreds and thousands of years. However, considerable quantitative and qualitative changes in various systematic groups of aquatic animals have occurred in the waterbodies during the last 50 years due to the human impact. Gradual weakening and degradation is taking place in the ichthyofauna with the following succession: salmonids – whitefishes – smelt – perch – cyprinids. This is how the community responds to the enviromental changes caused by the rapid eutrophication of shallow Northern lakes. Even in deep Lake Onega there is a trend of transformation from salmon-whitefish dominance into whitefish-smelt-perch dominance. Such acceleration of negative processes is especially harmful to geologically young and vulnerable ecosystems, like inland water bodies of Northern Europe with their extremely low capacity for self-purification. At present the water bodies are used for a variety of purposes: fishery, water supply, recreation, wastewater disposal and navigation. The constantly increasing anthropogenic load on the fish population has turned the conservation of the biological diversity of the Vologda region water bodies into an acute issue.

At present the ichthyofauna of the Vologda region consists of 52 species (or 67 varieties including a land-locked form) from 17 families, and also 2 species of lampreys. The arctic part of the ichthyofauna complex is deteriorating. The changes in the fish populations have made it necessary to define distinct indicators as key parameters to be used in biodiversity monitoring. The traditional approach is to keep an eye on the status of deteriorating fish populations, which in the Northern water bodies are usually represented by the sturgeons, salmonids and whitefishes, as they have high commercial value and are sensitive to anthropogenic impact. Environmental factors, such as oxygen deficiency, temperature, depth and appropriate spawning areas, are vital determinants for these populations. Thanks to their high polymorphism, whitefish species adapt to new conditions very easily. When isolated, these populations are able to generate endemic and dwarf forms. The formation of dwarf white fish is connected with the change of growth rate, early pubescence, and small sizes of adult individuals.

Two unique populations of whitefishes live in the basin of the North Dvina River in Lake Kubenskoye, which is the southernmost lake in the European part of Russia with whitefish population. One of them, a land-locked form of the inconnu, *Stenodus leucichthys nelma* (Pallas),

was generated from a spawning stock in the North Dvina River isolated in the late 19th century, when a dam was built across the migratory ways in 1834. Inconnu then adapted to the lake conditions and achieved a fast growth rate, a shorter life cycle and early pubescence. As the inconnu began to be adapted to the lake, it used the largest tributary of the lake, the River Kubena, for spawning together with the dwarf whitefish. This dwarf whitefish, *Coregonus lavaretus nelmuschka* (Pravdin), is an endemic glacial relict form of whitefish, which was left in Lake Kubenskoye during the retreat of the Valdaisky Glacier. Morphologically it is closest to the whitefish of Lake Onega in the Baltic marine group. Compared to the nelma from the *Stenodus* family, which lives only in Lake Kubenskoye, the natural habitats of the other whitefish family *Coregonus*, which is represented by whitefishes and vendaces, include about 20 small lakes in the Northwest of the Vologda region. However, the richest populations can be found in Lake Onega and Lakes Beloye and Vozhe.

At present the whitefish populations have declined due to over-fishing, eutrophication and pollution. The inconnu population in Lake Kubenskoye collapsed in the middle of the 1960s due to over-fishing and habitat degradation. Since the 1970s the nelmuschka of Lake Kubenskoye has lost its commercial value. During the 1980 – 1990s the catches of nelmuschka were extremely small ranging from 0.1 to 2.5 tons or an average of 0.7 % of the total yield from the lake. The catches of vendace in Lake Beloye were extremely small, ranging from 0.01 to 0.50 tons, and since 1994 the vendace does not appear at all in commercial catches at Lake Vozhe.

The first results of a genetic analysis of Vologda region whitefishes revealed the necessity to clarify their taxonomic status. The vendace *C. albula* of Lake Beloye and an endemic form of whitefish, *C. lavaretus nelmuschka* of Lake Kubenskoye were studied using both morphological and genetic analyses. The polymorphic allozyme loci and the morphometric features confirmed the intermediate position of Lake Beloye vendace between *C. albula* from the River Volga basin and *C. albula/C. sardinella* complex of the River Pechora. This data confirmed the hypothesis of the introgression of *C. sardinella* genes into Lake Beloye vendace population, and also evidenced a relatively long isolation of the latter, which has caused the differences in this form.

A unique polymorphism of the *C. lavaretus pidschian* is represented by the nelmuschka whitefish, which in Lake Kubenskoye has reached a subspecies status of *C. lavaretus nelmuschka*. This is also confirmed by genetic and morphological data. Additional genetic comparisons of *nelmuschka* with whitefish forms inhabiting European lakes are required to further elucidate its origin and status, and also to clarify the inter-relations between these species. The high specificity of the genetic constitution of these forms revealed in our study suggests the necessity of further investigation of their status by modern molecular genetic techniques. Designation of these forms as threatened subspecies would be most practical, bearing in mind the problematic restoration of the unique populations in case of their extinction.

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Forestry projects

International Forest Machine Operator Training Centre, Svetogorsk, Russia.

(Report prepared for Ministry of Agriculture and Forestry, Finland. August 2003.)

Tampere College / Kuru Institute of Forestry has established a Training Centre in Russia, located in Leningrad region, in Svetogorsk. The Training Centre was officially registered in June 2002.

The work under the project, financed with the support of the Ministry of Agriculture and Forestry, Finland, included training for two Russian forest machine instructors in Kuru within the years 2002-2003. Now they are part of the staff of the Training Centre. Several printing works and publications were prepared during realization of the project, financed with the support of the Ministry of Agriculture and Forestry: work safety guidelines for mechanized harvesting, issued in cooperation with Saint-Petersburg Forest Academy; safety manuals for harvester operator, forwarder driver, chain saw operator; chain saw operator manual, etc. Study programs for different courses were also developed within the frame of the project. The training of 6 Russian instructors began in Svetogorsk in the last stage of the project. It continues from the 1st of September.

Nowadays the Training Centre can offer theoretical and practical forest machine operator training. Theoretical training is organized in the classroom located in Svetogorsk, practical training – in the forest near from Svetogorsk.

The Training Centre owns 1 harvester PONSSE ERGO HS16 and 1 forwarder PONSSE ERGO S15, which are used for educational purposes.

Accommodation for students is organized in the hotel, located about 15 km from Svetogorsk at the Vuoksa river. Accommodation during practical work in the forest can be arranged in 2 forest wagons, fully equipped with all facilities.

The Training Centre also owns a service wagon, equipped with all necessary tools and equipment for daily service and maintenance of the forest machines.

Transportation of the students to the forest is provided with the use of two Russian made off-road vehicles UAZ. 8 passengers can be put into each car.

There are 12 persons working as permanent staff of the Training Centre, 6 of them are Russian forest machine instructors, who have the ability to assist Finnish instructors during realization of the courses.

The Training Centre has a contract with International Paper, Svetogorsk for forest cuttings and use of the logging sites for practical training of the forest machine operators and chain saw operators training. But in future it might be necessary to have our own logging sites, where the Training Centre can make its own planning for logging operations according to the needs of training, independently from the commercial plans of the IP or other timber selling company.

Within one year after its creation the Training Centre, with support and participation from Kuru Institute of Forestry, built enough capacity to apply for the license giving the official right to

organize practical training in the Leningrad region. Whole the process of getting the license took over half a year. Finally the license was given to the Training Centre in August this year.

There are 3 basic educational programs that Training Centre realizes according to the license, given by the Committee of Vocational Education of the Leningrad Region:

1. 5,5-month harvester and forwarder operator training including 1 month theory and 3 months practical work in the real conditions of the mechanized harvesting;
2. 1-month forwarder driver course;
3. 1-month chain saw operator course, cut-to-length method.

Additionally Training Centre offers all kind of courses demanded by customers: 2...3-week intensive harvester operator course, 1-week theoretical training on cut-to-length harvesting method, 1...2-week training on computer measurement system of the harvester, etc.

All the courses, organized by the Training Centre now run under the control and guidance of the Finnish instructors from Kuru Institute of Forestry. The Training Centre has begun the program of Russian forest machine instructors' training, who after 1,5...2 years will be able to work independently and to run forest machine operator courses without help from the Finnish forest machine instructors.

Plans for close future:

1. To get more forest machines to the Training Centre.
2. To develop cooperation with Russian forest colleges and institutions.
3. To establish close connections with forest authorities of the Leningrad region.
4. To develop cooperation with Russian logging companies and to organize training for them on a permanent basis.
5. To involve Finnish and Russian forest machine producers in the work of the Training Centre and to get support from them and also from funding organizations for development of the activities of the Training Centre.

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Forestry Training Need Analysis in the Leningrad Region



The forest sector is one of the most important industries in the Leningrad region. The forest industry and woodworking enterprises account for a big share of the total amount of industrial production.

Based on other investigations it can be stated that modern forest-harvesting companies and forest sector enterprises experience a range of problems. They are mainly related to funds for development and optimisation of production, supply of accessible raw material, difficult working conditions for the personnel engaged directly in the production, and necessity of maintaining the infrastructure in the forest settlements. A significant part of the problems is connected to forest market, high transport costs, monopolies, and high costs on energy, illegal forest business, and absence of small-sized forest market.

Despite of significant changes descending now in Russian forestry, demand to a manpower skill level and the level degrees of staff for work in new conditions will grow constantly. For the future specialists this is a problem that has to be recognized and solved by educational institutions in conformity with the new educational programs. The organization of a retraining system is necessary for the nowadays-operating experts and workers.

Thus it is important to establish, what kinds of educational services are really necessary to the enterprises for the solving of problems connected to the human factor. The offered educational services should as far as possible follow an existing system of staff retraining and have to correspond to the programs of educational institutions of forestry.

The given assessment had the purpose to reveal problems of forestry caused by the human factor, and to define possible ways to solve the problems.

Purpose of Training Needs Assessment (TNA)

In general, the purpose of performing TNA is to provide possibilities for determining the training areas with the most urgent need, where training will provide the greatest effect, and where companies in question have agreed with the needs and therefore are interested in investing into training courses, either in terms of time or/and funding.

The purpose of this specific TNA was to analyse tendencies of requirements for workers and specialists at forest enterprises and forest management units (leskhoz) in the whole Leningrad region. It was aimed at revealing the possibilities for increasing the overall performance of the forest management and forest industry enterprises through personnel training, development of a long-term policy for technology optimization, and creation of a basis for further improvements.

Flow of TNA

Training need assessment for personnel of Forest Harvesting Companies and Forest Management Units in Leningrad Region was implemented in the years 2002 - 2003. The study was carried out by an international group under the guidance and financing of the Ministry of Agriculture and Forestry in Finland.

The basic tools applied for information collection were interviews of personnel of the companies and a written questionnaire filled in by various departments of the companies according to their area of responsibility. The methods used for data processing were swot-, flow-chart and cause-effect – analysis. The results have been presented in the form of a Training Plan for the model companies

and units and further generalized to an estimation of quantitative training needs in the Leningrad region.

Results

Forest harvesting companies

To simplify the results, one could say that the needs for training are rising from the point of view of companies from the need to an overall improvement of activities and attempt to higher productivity. Training is rated as one of the most important tools to find development, but the companies are not ready to invest into it. The training needs for the management occur in the subjects of general management and planning, economy and business and forest certification. The medium level management and specialists need training in wood markets and marketing, development of forest harvesting and to adopt computer based methods in their work. The needs for training among the forest workers are upgrading of skills in forest harvesting.

Table 1. Quantitative need for training in the forest companies in Leningrad region (estimation).

OCCUPATION	TOTAL NUMBER	AMOUNT OF TRAINING DAYS (ATD)	Minimal (10 % trained) ATD	Medium (50 % trained) ATD	Maximal (75/100 % trained) ATD
Chainsaw operators	800	13	1 040	5 200	10 400
Tractor operators	300	5	150	750	1 500
Repair workers and mechanics	460	5	230	1 150	2 300
Harvester/Forwarder mechanics	60	10	60	300	600
Sawmill workers	600	10	600	3 000	6 000
Harvester/Forwarder operators	30	40	120	600	1 200
Computer specialists	60	5	30	150	300
Experts and specialists	60	10	60	300	600
Managers	60	20	60	600	1 200
General computer training	300	5	150	750	1 500

The minimal variant means that for each enterprise should be trained not less than 10 % or at least one representative in each category (operator, foreman, mechanics etc.). The maximal variant shows the need of training days if all the personnel will be trained according to the proposal.

Forest Management Units

As expected, the need for training in the Forest Management Units is huge comprising practically all the forestry activities aiming both to upgrade professional skills and to meet the requirements of new tasks and duties. The training is regarded rather high among the forest specialists; among methods to increase an overall enterprise performance the most effective is considered the change of payment methods (probability that it will influence is appreciated in 50 %). On the second place is the personnel training (30 %) and on third auditing of working methods (20 %).

The needs for training in the Forest Management Units are for the management in the subjects of legislation and administration, general management, economy and public relations. The medium level management and specialists need training to upgrade their skills especially in forest

regeneration and silviculture and to adopt new tools and working methods in forest planning and planning and implementing of forest harvesting. The needs for training among the forest workers are corresponding with the ones of specialists but on practical level.

Table 2. Quantitative need for training in the forest management units in Leningrad region (estimation).

OCCUPATION	Number to be trained	Number of planned courses per each category	Number of training days per one person	Total number of training days
Management	140	3	10	4200
Experts and Specialists	200	3	13	7800
Chief of sub-unit/vice-chief	220	2	8	1760
Foremen	640	3	15	9600
Foresters	1300	3	11	14300
Total forestry staff	2500	34	-	37660
Repair workers	60	1	5	300
Workers (thinning, planting)	140	3	11	1540
Total	200	-	-	1840

Need for development of educational institutes

The role of various educational institutions is rather unclear when we speak about upgrading the skills and knowledge of forest sector professionals. This can be carried out most productively through continuous education. Such education is provided for academic professionals by the All-Russian Institute for continuous Education for Forestry in Pushkino, and by practically taken all the Russian forest technical academies and universities. St. Petersburg Forest Technical Academy is the focal point in Leningrad region in this respect.

The secondary educational based professionals receive further and upgrading education also through the All-Russian Institute for Continuous Education, and through the most competitive secondary educational institutions. Also universities may provide them courses. Lisino Forestry College is the focal point in this respect in Leningrad region.

But does the supply of these educational institutions meet the needs and requirements of the clients, both public and private ones, individually and employer paid ones? It seems that the main educational institutions are and will be increasingly competing with each other, and provide for that purpose all type of educational services in which they are not competitive or even professional enough.

Conclusions

The key issue before one can provide competitive services for clients is to upgrade the skills and knowledge of personnel, upgrade the facilities and improve the management practices of the educational institution. Without these functions it is hard to manage well in increasing competition, and meet the requirements of various clients. One way for that is to network with relevant foreign and domestic educational institutions and if found appropriate, become a model or pilot educational entity for the forest sector. This can be achieved for example by collaborating closely with international development programs and projects funded by the World Bank, the European Union

technical programs or bilateral donors. Even some larger investors might have potential interest for such a collaboration and development. Except development of teaching, also the organizational development has to be taken care of. The experience in similar development activities in Estonia shows that establishment of departments for continuous training is necessary if aiming significant results.

It is also essential that the management of these institutions have close and operational relationships with the regional and local administrations, as the case usually is, in order to be able to promote particularly regional and local funding for upgrading the facilities and basic infrastructure.

It is sensible to build up closer partnerships with the locally operating forest industrial companies and other actors in the forest sector, and follow closely the working life development. Without close contacts with them it is difficult to foresee the future development needs in various labour markets and thus to be in the front of the development processes. Educational institutions should graduate professionals for future, not to sustain and stick to the old traditions too much.

It is also recommendable that the full chain of production processes would be covered when educating the future professionals as they need to know more and more about their own position and importance for the final products or services produced.

It would be useful for the educational institution to be involved with the full chain of the educational process when developing forest sector organizations, being they private or public by character. Training Needs Assessment is the crucial start of the process. Logically the design of educational plans, courses and modules comprise the next phase of the process. After this training of trainers should be taken care of. The next phase is training of trainees, after which various evaluations, either self- or externally implemented ones should follow. These types of activities could and should be carried out together with the clients, and the educational entity should try to be active and collaborative in such activities. Also external educational consultants are being recommended to be used in this context, as it claims for deep understanding and special knowledge about educational development and learning processes.

In addition it is of utmost importance to develop the content of curricula and other educational services. There are several ways and methods to do that, and TNAs implemented in Leningrad regions provide such advice.

Recommendations

We have tried to point out in this study that the development of the public sector, private sector measured at organizational and individual levels is closely linked and dependent on the competitiveness of the educational services that can be provided to various customers of educational services. As the educational institutions have faced severe problems particularly in the last decade in Russia and they need for their recovery partnerships with federal regional and local administrations, new type of and close partnerships with the private sector and close collaboration with local people and other actors utilizing forests, it is recommendable that these stakeholders understand the value and benefits to develop locally and regionally educational entities.

For the organizations acting in the forest sector and planning to procure educational services it is recommendable that the full chain of educational process would be followed when the full organization is being developed. Training Needs Assessment is the crucial start of the process. Logically the design of educational plans, courses and modules comprise the next phase of the process. After these efforts training of trainers including teachers and other professionals to be used as trainers, should be taken care of. The next phase is training of trainees, after which various

evaluations, either self- or externally implemented ones should follow. This process lead to best results and increase of productivity, if it will be implemented in close collaboration with experts from educational institution that will be used as the training entity, and with external educational experts familiar with TNAs and the whole learning process. The process is also enrichment from the viewpoint that it makes the client to start analyzing systematically and critically his needs in the future and what kind of professionals and other employees are really needed, and what type of will likely to be deleted. It also increases the understanding for the value of personnel in every organization.

Improvement of the professional level of specialists working in the forest sector enterprises is one of the important tasks to be accomplished in developing the competent and inexhaustible forest use in all regions. There are in-house and institutional recourses that could be used for this purpose.

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The Development of Sustainable Forest Management in Northwest Russia (2001-2004)



The general aim of the project is to promote the development of forestry in Northwest Russia by compiling in co-operation the forest management recommendations based on new research knowledge, practical experience, available forest technology, regional natural conditions and international agreements. These recommendations concern forest regeneration and tending of young stands, thinnings and final cuttings in cut-to-length method and multi-objective forest management planning.

Background

Many new project proposals, mostly dealing with forest regeneration, wood harvesting and multi-objective forest planning, were presented by different specialists to the second phase of the Finnish-Russian Development Programme on Forestry in Northwest Russia (for 2001-2004). The separate project proposals were, however, scattered, and mostly based only on personal contacts without support from their organisations. Obviously the effectiveness of this type of small projects would be insignificant. Therefore it was seen useful to bring together the knowledge and resources by establishing a consortium where expertise of forestry, forest research and forest education from the different regions and republics of Northwest Russia would be represented. By this way the utilisation of the results will be expanded essentially.

The starting point of the development project presented here is the regionally determined goals of forestry and combination of the project activities with ongoing domestic development processes and projects of forestry in the regions on the basis of which:

- the gaps in knowledge will be surveyed,
- new development projects on the most important questions will be carried out,
- new recommendations for forest management will be prepared, and
- training for adaptation of new recommendations will be organised.

Project structure and subprojects

The project consists of three subprojects and coordination. In each subproject there is a Russian leader and a deputy from Finland. Each subproject has formed a working group consisting of 5-9 Russian experts being responsible for detailed project planning and implementation. In each subproject Finnish experts and a Russian technical coordinator support this work.

I Forest regeneration and tending of young stands

The aim is to specify and develop the instructions for forest regeneration and tending of young stands so that good-quality and high productivity forest stands by intended tree species composition by middle of the rotation could be accomplished economically and in reasonable time, and also promoting the conservation of forest biodiversity. The subproject will support the work, led by the Northern Research Institute of Forestry (Arkhangelsk), to develop instructions for forest regeneration and management of young stands for North and Northwest regions of Russia by the order of the Ministry of Natural Resources (MNR) of the Russian Federation. The area will cover Murmansk, Arkhangelsk, Leningrad, Novgorod, and Pskov regions, and republics of Karelia and Komi.

Besides of the instructions, the working group will prepare proposals for developing forest legislation in the field of forest regeneration and management of young stands in the northern taiga

zone of Russia, to be presented for the MNR in 2004. Demonstration sites will be established and scientific experiments carried out on forest regeneration and management of young stands in order to demonstrate created instructions and to study new appropriate methods and practices for local conditions.

II Thinnings and final cuttings in cut-to-length method

The aim is to modernize and develop the guidelines for thinnings and final cuttings so that more attention will be drawn to recent technical and economic requirements, and to the retaining of valuable habitats and landscapes. Special emphasis will be put on development of Russian machinery for thinnings.

The main task of the subproject for the year 2003 will be the preparation of the guideline booklets on planning of harvesting site and on cost calculation. Guidelines should be applicable for the whole Northwest Russia area taking regional differences into consideration. The major task for the year 2004 will be preparing a textbook on "Machinery and logging methods for thinning operations in Northwest Russia – Principles and Practise". Both the booklets and the textbook are targeted for engineers of forestry and forest harvesting as well as for lecturers, postgraduates and students of forestry colleges, institutes and universities.

III Multi-objective forest management planning

After the starting seminar of the subproject in Pskov in autumn 2002, it was decided that the preliminary task of the subproject on developing a procedure for long-term forestry planning considering the economic, ecological and social needs for sustainable forestry would be duplication of already made work in the Pskov Model Forest (PMF) project. During the first phase of the PMF project in 2000-2003 emphasis has been on developing new methods and tools for improving forest planning and management by combining the needs of multi-purpose forestry and conservation considerations. Due to this it was decided to support further development of the established sustainable forest management model on ecological landscape planning in the framework of the subproject. Taking into account the needs of the developed forest management planning system as well as the amount of resources and time available, it was agreed to concentrate on creating mathematical models and computer programmes for thinnings. This work will provide a tool for estimating the influence of one or more commercial thinnings on economic profitability of cuttings as well as on changes in timber volume and quality of wood of a stand.

The final seminar of the whole project will be held in October 2004 in order to present and evaluate the project results and plan future activities in Finnish-Russian forest research cooperation.

In the beginning of the project the gaps in knowledge has been surveyed in each sub-project. Funding for implementation of development and research projects on the most important questions will be applied from external sources.

Wide range of participating organizations

Large group of organizations representing practical forestry, forest research and forest education from Northern, Northwest and Volgo-Viatski economic zones of the Russian Federation and from Finland participates in the project implementation, namely Administrations of Natural Resources and Conservation of Environment for Murmansk, Arkhangelsk and Leningrad Regions and Republic of Komi of the MNR of Russia, Northern Research Institute of Forestry (SevNIILH) (Arkhangelsk), Forest Institute of Karelian Research Centre (Petrozavodsk), Petrozavodsk State University, St. Petersburg Forest Research Institute, Mari State Technical University, Nizhegorodsk State Agricultural Academy, Pskov Model Forest project in cooperation with forest management

planning enterprises in Northwest Russia. The Finnish Forest Research Institute (coordination) and the University of Joensuu are the main project partners from Finland.

Cooperation with other projects

Nowadays we are working in the jungle of projects having national, bilateral, multilateral and international character. By organising the opening seminars in different regions of North and Northwest Russia (I subproject – Arkhangelsk, II – Petrozavodsk, III – Pskov) and by inviting specialists from practical forestry, forest research and forest education and administrations of the subjects and from different projects we have been trying to secure wide participation in project planning and implementation and also trying to avoid overlaps. Furthermore, we have stressed the adaptation of project activities to ongoing national processes in development of sustainable forest management as well as to activities of other relevant projects. The cooperation has been intensive with the Pskov Model Forest project, which achievements in elaborating new innovative methods and practices in forest management planning compatible for local conditions in Northwest Russia has been recognized also in the MNR. The model to be further developed for forest management planning has been seen appropriate to be distributed also to other regions of Russia. Besides, we have presented the project to participants of the Sustainable Forestry Pilot project and discussed possibilities for practical cooperation between the projects. The created forest management system in the Pskov Model Forest project could be used in the pilot leskhozoes of the three representative regions of the Pilot project, namely Leningrad oblast and Krasnojarsk krai in the Central Siberia and Khabarovsk krai in the Russian Far East. In that way our efforts in improving the planning system for thinnings in this project could be utilised also wider in Russia.

Timo Leinonen, Lauri Sikanen, Timo Karjalainen

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&

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International projects

Barents Region Habitat Conservation Forum: Great Challenges in Barents Region Forest and Mire Protection



The third meeting of the International Contact Forum on Habitat Conservation in the Barents Region was held from 3 to 6 November 2003 in Kuhmo, Finland. Previously there have been two international forum meetings: the first took place in 1999 in Trondheim, Norway, and the second in 2001 in Petrozavodsk, Russia. The third meeting was organised and led by Finland, the Contact Forum Chair.

This time the focus of international forum meeting was on developing the network of protected areas in Northwest Russia and the cooperation between the twin parks along the Finnish-Russian border. The protection of old-growth forests and mires and guaranteeing the functionality of existing protected areas were regarded as great challenges. There are considerable threats against nature in Northwest Russia, e.g. the uncontrolled activities of the forest industry and the construction of oil and gas fields. The objective of the forum is to promote sustainable use of natural resources and sustainable tourism. The participants also emphasized the importance of getting local inhabitants involved in the conservation work and of raising environmental awareness among the population. The results of this seminar will be published by the Finnish Environment Institute at the beginning of 2004.

The participants of the forum included 100 nature conservation experts from Finland, Russia, Sweden, Norway, Denmark, Estonia and Canada. About half of the participants came from various regions of Northwest Russia. The Contact Forum on Habitat Conservation in the Barents Region contributes to the Working Group on Environment of the Barents Euro-Arctic Council. Finland is responsible for the presidency of the Barents Working Group on Environment in 2003-2005.

During the Contact Forum Meeting there was information exchange and discussions between scientific communities, non-governmental organizations and conservation authorities. The objective of the Meeting was to figure out new needs of habitat conservation and outlines for new multilateral and bilateral strategies for cooperation in nature conservation and to find possibilities for development. The participants found it important that a wide international long-term project of biodiversity conservation be carried out in the Barents region.

The Finnish-Russian cooperation in nature conservation has gradually developed into international cooperation. A considerable part of this cooperation is coordinated multilaterally, especially between the Nordic countries and within the Barents cooperation. Also the support from the EU funding programmes and the action programme for the Northern Dimension contribute to strengthen the nature conservation cooperation in Northwest Russia.

What is the Habitat Contact Forum (HCF)

The International Contact Forum on Habitat Conservation in the Barents Region (Habitat Contact Forum, HCF) was established in 1999 in order to promote cooperation between Russia and the Nordic countries within the field of nature conservation. The founder countries – Finland, Sweden, Norway and Russia – have together created an arena on which national and local authorities, scientists, experts, representatives of indigenous people, non-governmental organizations and other interested actors can discuss nature conservation and cultural, economical and social questions in connection with conservation, thus finding and developing common solutions for them. The

cooperation network has already proved to be functional in several kinds of situations, from small-scale common projects to wide-reaching international questions of nature conservation.

The objectives of the HCF are to develop the administration of nature conservation in the Barents region, to give recommendations for the development and extension of the network of protected areas and to support other measures that promote nature conservation. The HCF acts as an advisory body also for the Barents Euro-Arctic Regional Council, which is carrying out the Barents 2010 Project.

From the beginning of 2004 the responsibility of chairing the Contact Forum will be taken over by Russia, and the next meeting of the Forum is proposed to take place in the Komi Republic in 2005.

Contact addresses and information about Nordic bilateral and multilateral nature conservation cooperation with Northwest Russia:

- The Finnish-Russian Development Programme on Sustainable Forest Management and Conservation of Biological Diversity in Northwest Russia, <http://www.ymparisto.fi/kvasiat/lahialue/venmetsa/venmetsa.htm>
- Directorate for Nature Management, <http://www.dirnat.no>
- Svanhovd Environment Centre, <http://www.svanhovd.no>
- Västerbotten County, <http://www.ac.lst.se/>
- Swedish Environmental Protection Agency, <http://www.naturvardsverket.se>

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International Jubilee Seminar, April 9 – 11, 2003 in the Paanajärvi National Park



A primeval forest... Do we, the people of today, know what it is? Are you sure that the forest where you always go to pick berries and gather mushrooms is a primeval one?

According to Finnish scientists, a primeval forest is a natural old-growth forest with stands of all different ages, with a great number of decayed trees and also old deciduous stands. The Finns consider this kind of forest to represent true nature. In such forests all forest inhabitants exist in harmony with nature's laws, and are born, live their lives and finally die without human interference. Nowadays only small areas of such forests can be found in Western Europe. Most often you will see so-called commercial forests, predestined for timber production. In these forests the basic rules of forest community development have been disturbed. They have been unmercifully cut by man. People who have seen such forests, for instance in our nearest neighbour Finland, probably agree that they make a doleful sight. But in the North of Russia, in Karelia you can find nature, untouched by man, and virgin forests in their primary natural condition. These areas are in acute need of protection, not only because the forests function as a laboratory cleaning the air of our planet, but also because these territories form a large natural basis for scientific purposes. The network of protected areas (NPA) in Karelia covers more than 5 % of the whole territory. National parks play their own significant role in NPA development. Paanajärvi National Park, which had its 10th anniversary last year, is one of the leading national parks. A modern visitor centre was opened at the end of last year, which makes it possible for the National Park to organize different scientific and practice-oriented conferences in its territory. The Finnish-Karelian International Symposium dealing with nature conservation and biodiversity in Northern Europe, which took place in April this year, can be considered one of the most significant happenings.

History. Threatening misfortune turned into a fortune

Finnish and Karelian scientists met in Petrozavodsk in April 1989 to discuss the possibilities of establishing Paanajärvi National Park in Karelia, the strife for which had been going on for several years. The forum of scientists from both countries played a decisive role in this strife, which at times obtained dramatic features. Lake Paanajärvi area was known by only few: frontier guards, local inhabitants and a small circle of scientists. This was due to the fact that this was a restricted area because of its location adjacent to the State border. And this territory was very much like the end of the world. This area with its endless rocks and lakes had been uninhabited for a long time and lacked even elementary roads.

However, pumped-storage power plant engineers became interested in this wild and forgotten corner. Had the plant been constructed, it would have destroyed the primeval nature of Lake Paanajärvi. The scientists had no doubts about this, as they knew that the Lake Paanajärvi region had arisen interest among the scientists and been surveyed already at the beginning of the 19th century. The first scientific materials concerning the Paanajärvi area date back to 1842. The first plant collections from Kivakka Mountain made by scientist F.A. Nylander have been preserved since then. This is why at the end of the 1980s the contemporary scientists decided to start to act for Lake Paanajärvi and to save it. New surveys were immediately started in this territory.

Karelian Switzerland

The strife of scientists and the large public opinion in Karelia and Finland ended successfully, and Paanajärvi National Park was established in May 1992. The scientists also succeeded to save Nuorunen, the highest mountain in Karelia, where a downhill skiing centre was being planned. The area of Nuorunen mountain was also included in the Paanajärvi National Park.

The persons who took part in those developments, e.g. A. Koutchko, former employee of the Karelian Research Centre of the Russian Academy of Sciences, scientists Freidling, Shoustov, Kravchenko and others, and also several Finnish scientists say that this experience was an excellent example of co-operation between scientists from different countries.

After the park had been established, ordinary field expeditions to survey the nature of the Lake Paanajärvi area were started. All the surveys once more proved the uniqueness of the Paanajärvi area. The most precious pearl among all is Lake Paanajärvi, after which the National Park was named. Unlike many other Karelian lakes, it is long and narrow and elongates from east to west. This form is due to the origin of the lake: it was formed millions of years ago as a result of an earthquake, which tore apart the crystalline basement. Lake Paanajärvi is one of the deepest lakes in Fennoscandia and is often called "Northern Baikal". The length of the lake exceeds 23 km, the width varies from 1 to 1.5 km, and the maximum depth is 128 m. The deepest point is situated not far from another point of interest with no lesser value: Ruskeakallio Cliff (Brown Cliff). Lake Paanajärvi is almost as if framed by cliffs, among which the Ruskeakallio Cliff is the most majestic one. It is situated at the northern shore of the lake, and its vertical wall rises up to 60 m above water level. On a sunny day the cliff shines in reddish brown formed by the lichens growing on the rocky wall. The scientists say that Ruskeakallio Cliff is a real treasure for them. The cliff consists of different kinds of rocks at its whole length, which can tell many interesting things about the history of Earth. Many rare plants grow on the wall for the botanists to be found, and the first sprouts appear already at the beginning of April.

It would be easy to go on and on describing the charm of the park. With its high fells, virgin forests, beautiful lakes and rivers and extremely interesting flora and fauna, this area is justly called the Switzerland of North Karelia. The history of this region is also very interesting. When Finland was part of the Russian Empire, there were Finnish villages here, which were connected by good roads, and the inhabitants led quite prosperous lives. Traces of these old settlements can still be found, and they tell the scientists interesting facts about the history of Lake Paanajärvi.

Everybody agrees that today the Lake Paanajärvi region needs to be protected and surveyed. This territory needs further development and investigations, and tourism should also be advanced. Tourism is not the main activity of the Park, but it does play a leading role in the development plans. The tourism must be ecological, which in turn requires good infrastructure and fully qualified specialists. The park personnel raise the level of their skills by using the methodological basis that the park has developed thanks to the productive co-operation between different, also international, organisations, and also between the scientists of the Karelian Research Centre. The last international symposium in April was very helpful for the Park in this respect. Finnish and Karelian scientists told about their investigations and made presentations about their work and also delivered to the administration of the Paanajärvi National Park all symposium material, as well as the collected scientific articles, published by the Karelian Research Centre. At this meeting the scientists once again noted, that the area of Lake Paanajärvi is unique, and once more confirmed that they had made the right choice over 10 years ago, when they decided to save the area of Lake Paanajärvi.

International co-operation

Nowadays Paanajärvi National Park is famous not only in Russia. Many international organisations know about it. The park managed to find a way out from the circle of financial problems through international programmes and projects, the most important of which was the great TACIS project on Karelian Nature Protection Area Network Development, and thus it was able to make great material and technical improvements and to build a modern visitor centre, the planning of which had started in the very first days of the Park's existence. Paanajärvi National Park also participates

in the Finnish-Russian Development Programme on Sustainable Forest Management and Conservation of Biological Diversity in Northwest Russia, which has already entered the 2nd phase. The main partners of this Programme are the Karelian Research Centre of the Russian Academy of Sciences and the Finnish Ministry of the Environment. The symposium in April was conducted under this Programme, and it was financially supported directly by the Finnish Environmental Institute.

During the symposium an excursion was made to Lake Paanajärvi and to Ruskeakallio cliff. When standing next to this magnificent rocky cliff, I honestly felt very small and insignificant. When approaching it on the ice I had a feeling, that it was not me who was walking towards the cliff, but it was the cliff that was slowly drawing closer and closer with the wind howling in its ledges. People standing at the foot of the cliff could barely be seen from a distance of about 50 steps. The powerful ancient cliff demonstrated with all its strength the smallness of man, who still sees himself as lord and master of nature.

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(The article has been published earlier in the Prionezhye Newspaper)

Old-growth forests in the Arkhangelsk region – conservation perspectives



An international seminar "Old-growth forests in the Arkhangelsk region – conservation perspectives" was organized in Arkhangelsk 6. -12.6.2003. Sixty scientists, authorities, representatives of non-governmental organizations and other stakeholders from the Nordic countries and Northwest Russia were offered an opportunity to consider and discuss their interests in the forests of the Arkhangelsk region. One aim of the seminar was to prepare a coordinated action plan for the establishment of new protected areas in old-growth forest territories until the year 2005.

Scientists and authorities from Norway, Sweden and Finland have had nature conservation cooperation in the Arkhangelsk region for a long time. The International Contact Forum on Habitat Conservation in the Barents Region (HCF), established in 1999 by the above-mentioned Nordic countries and Russia, has promoted multilateral nature protection cooperation in the region. Starting in 1997, international scientific expeditions have been organized to five intact forest territories in the Arkhangelsk region.

The first international expedition was organized to Onega Peninsula in 1997. Corresponding expeditions were made to Belomore-Kuloi Plateau in 1998, to Kozhozero in 1999, to the Yula river basin in 2001 and to the Mezhenskaya Pizhma river basin in 2002. The objective of these expeditions was to investigate the natural, biodiversity and geological values and to have an overview on the cultural and social-economic aspects of the territories. Conservation recommendations were made for each territory on the basis of investigation results and expert estimations.

The seminar "**Old-growth forests in the Arkhangelsk region – conservation perspectives**" was organized as a follow-up of the long-term cooperation. A lot of research information on the old-growth forests of Arkhangelsk region was presented and followed by active discussions. The seminar resulted in a unanimously accepted resolution, including conservation recommendations for the five expedition target territories.

An excursion to Golubinsky protected area (zakaznik) on the border to Pinega Strict Nature Reserve (zapovednik) was arranged on the last day of the seminar. The participants enjoyed the hiking trip to the Pinega river valley and karstlands. A very interesting experience was to explore the caves formed thousands of years ago, when the underground waterways and melting waters of the glacial period dissolved gypsum and other sulphate soils.

Participants of the seminar expressed their gratitude to the Organizing Committee, the Department of Nature Resources and Environmental Protection of the Ministry of Natural Resources for the Arkhangelsk region, to the Administration of the Arkhangelsk region and to the three Nordic countries for arranging the international seminar. The importance of this kind of meetings was acknowledged and the participants considered it reasonable to organize the next seminar on the old-growth forest issues in 2005.

The seminar resolution and collected materials are published both in Russian and English. The report – "Old-growth forests in the Arkhangelsk region – conservation perspectives" was prepared by the Norwegian Directorate for Nature Management, Svanhovd Environmental Centre, the Norwegian Polar Institute, the Head Department of Nature Resources and Environmental Protection of MNR for the Arkhangelsk Region and the Institute of the Ecological Problems of the North in Arhangelsk. Further information and the report are available from the Directorate for Nature Management of Norway, Trondheim, <http://www.dirnat.no/>, e-mail: postmottak@dirnat.no.

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Publications

Three Decades of Nature Conservation Cooperation between Finland and Russia



Authorities, scientific institutions and other actors in Finland and Russia have cooperated within nature conservation for already 30 years. The various forms of this cooperation are presented in the recently published booklet "Finnish-Russian Nature Conservation Cooperation". The geographical area covered by this cooperation has extended and at the moment Finland has been involved in the process of establishing 10 new nature reserves in addition to all ready established 12 ones.

Already several decades ago, satellite images displayed a dark green forest belt between Finland and the Soviet Union, from the Gulf of Finland in the south to Petsamo in the north. Such a concentrated belt of old-growth forests is unique in Europe. However, these forests had remained in virgin state due to military reasons and the political changes made it possible to exploit them. Large areas have already been cut but much of this valuable Fennoscandian natural heritage, "the Green Belt", have also been investigated and protected for scientific reasons.

The zone along the border of Finland and Russia is of great scientific interest as the natural conditions on both sides of the border are similar whereas the land use patterns have been rather different. Thus it is easy to understand that scientific cooperation was of crucial importance when the Friendship Park was established in Kuhmo in Finland and in Kostamus in Russia. Thereafter followed an inventory of the border region of Karelia and recently the cooperation has also been extended to other parts of Northwestern Russia: to the regions of Murmansk, Leningrad, Arkhangelsk and Vologda and to the city of St. Petersburg. Beside forests, large mires in a natural state have been in focus. Important forms of the cooperation have been protection of endangered animal and plant species and their habitats, compiling of "Red Lists" of endangered species, management of cultural habitats, promoting of ecologically sustainable nature tourism and development of environmental education. It has also become apparent how important it is to regard the network of protected areas in Northwestern Russia as a whole, and an international project with such a scope is under planning.

Two years ago the government of the Russian Federation confirmed a list of new protected areas on a federal level that would be established during the years 2001-2010. Three of these areas are located in northwestern Russia: the Kalevala National Park in Karelia, the Onega Peninsula National Park in the Arkhangelsk region and the Ingermanland Strict Nature Reserve in the Leningrad region. All these objects are also included in the list of proposed protected areas within the Finnish-Russian cooperation.

The Finnish-Russian cooperation has been developed into an international cooperation in which also EU and other Nordic countries are now involved. A part of the Barents Council cooperation is the Habitat Contact Forum, a common working group for Norway, Sweden, Finland and Russia.

The new booklet has been compiled by a large number of Finnish and Russian experts, mostly within the environmental administration and scientific institutions. Among the authors we should mention especially professor emeritus **Rauno Ruuhijärvi** who has promoted the protection of numerous natural objects in Russia during his long period as chairperson of the Finnish-Russian working group for nature conservation in 1986-2002. Since 2002, the working group has been

chaired by **Aimo Saano** from Metsähallitus (National Board of Forests) and **Tapio Lindholm** from SYKE.

More information:

The booklet "Finnish-Russian Nature Conservation Cooperation (36 pp, published by the Finnish Ministry of the Environment and the Finnish Environment Institute) (in Finnish, Russian, or English) can be ordered from the Finnish Environment Institute (phone -358-9-403000)

On the internet:

www.ymparisto.fi/kvasiat/lahialue/venmetsa/venmetsa.htm

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Biological Diversity in Karelia: Formation, Biological Communities and Species



The Karelian Research Center of the Russian Academy of Sciences (RAS) has been implementing the Biological Diversity Inventory and Study Project in the Republic of Karelia since 1997 within the Finnish-Russian Development Programme on Sustainable Forest Management and Conservation of Biological Diversity in Northwest Russia. Approximately 75 scientists representing more than 20 different specialities from the Forest Institute, the Institutes of Biology, Geology and Aquatic Problems of the North take part in this project. The research activities are co-ordinated by the Forest Institute (by the Research Managers V.I. Krutov, Doctor of Biological Science, and A.N. Gromtsev, Doctor of Agricultural Science). The project is being financed by the Finnish Ministry of the Environment.

In 1997–2000 biodiversity inventories were carried out in the most valuable part of the Republic of Karelia in this respect. There were regions with the most intact forest, mire and aquatic ecosystems and thus they had the highest level of biodiversity: 1) areas near the Russian-Finnish border (1997), 2) White Sea coastal areas on the Karelian side (1998), 3) areas on the Zaonezhkiy peninsula (1999), 4) Northern coastal areas of Lake Ladoga (1999) and in Central Karelia (2000).

The Monograph of Biological Diversity in Karelia: formation conditions, biological communities and species was published in 2003, and it was based on the survey results and the analyses of compiled information (authors: A.N. Gromtsev, S.P. Kitayev, V.I. Krutov, O.L. Kouznetsov, T. Lindholm, Y.B. Yakovlev). The present state of regional biodiversity has been summed up in this Monography according to the latest inventories.

The publication consists of four inter-related parts. Chapter 1 contains detailed descriptions of climatic, geological and geomorphologic, hydrological and soil-related conditions of the regional biota formation. Chapter 2 contains biodiversity descriptions and assessments of forest, bog and meadow ecosystems, and Chapter 3 contains detailed information about the biodiversity of terrestrial biota on a species level (vascular plants, bryophytes, aphylophoroid fungi, lichens, mammals, birds and insects). The analyses of aquatic flora and fauna are given separately (algae, zooplankton, periphyton, macrozoobenthos and fishes). Different methods of zoning the region according to biodiversity criteria have been largely applied. The present state of regional biota has been analysed with the nature conservation areas included, and also elements of anthropogenic transformation have been assessed.

No similar multi-level summaries have been made at least in the European part of the Russian boreal zone. This Monograph contains vast information for scientists of different specialities, and also for senior and post-graduate students working in the fields of ecology and biology.

The authors express their deepest gratitude to the Finnish Ministry of the Environment and to the Nature Protection Section of the Finnish-Russian Development Programme on Sustainable Forest Management and Conservation of Biological Diversity in Northwest Russia, which is co-ordinated by the Finnish Environmental Institute, for the financial support and scientific co-operation during the whole period of studies and the preparation of this publication.

The publication can be ordered from:

Forest Research Institute, Karelian Research Centre, Russian Academy of Sciences
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Biodiversity and conservation of boreal nature – Proceedings of the 10-year anniversary symposium of the Nature Reserve Friendship

The publication is based on the presentations and posters of an international symposium in Kuhmo, Finland from 16th to 19th October, 2000. The symposium was arranged to celebrate the 10-year anniversary of the Finnish-Russian Nature Reserve Friendship. Altogether there were 140 participants from eight countries in the symposium. The publication consists of 63 articles, which deal with the biodiversity and conservation in the boreal coniferous zone, especially in the so-called Green Belt along the Finnish-Russian boundary. In addition, a few articles give information about history, environmental education and ecotourism. The articles about natural sciences deal with bedrock, soils, forest, mire and water ecosystems as well as flora of plants and fungi, and fauna. As a synthesis of these topics nature conservation principles and practices are treated.

Raimo Heikkilä & Tapio Lindholm (eds.): Biodiversity and conservation of boreal nature – Proceedings of the 10-year anniversary symposium of the Nature Reserve Friendship. The Finnish Environment Institute 485. 325 pp.

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The Red Data Book of the Murmask Region



The Red Data Book project of the Murmansk Region was initiated by the Murmansk Region Environmental Committee in 1997. Two brief publications had already been published earlier: “Rare and Conservation-Dependent Animals and Plants of the Murmansk Region” was published in 1979, and the second edition of this book came out in 1990 with a slightly altered name: “Rare and Conservation-Dependent Plants and Animals of the Murmansk Region”. These books were compiled under the leadership of the Murmansk Regional Council of the All-Russian Nature Conservation Society, and all scientific organisations of the region also took part in the project. Thanks to the enthusiasm of the most active scientists and specialists taking part in this project, this rather complicated task could be fulfilled.

Many of these specialists had also participated in the preparation of the Red Data Book of Eastern Fennoscandia. After the establishment of a regional state authority, which was also entrusted with the monitoring the conservation of biodiversity, it became evident that a new manual was needed. A judicial document was also to be drawn up to regulate our interrelations with the world of the wilderness. This work was carried out by V.N. Petrov from the Institute of Northern Industrial Ecology together with other specialists. The task turned out to be very complicated, not only because it was the first of its kind and because there were different views among the scientists, experts and specialists representing environmental and trade organisations, but also because of constant reorganisations within the environmental authorities. The draft statute was examined and approved by the experts of the VNIIPriroda Institute. Later the Statute on the Murmansk Region Red Data Book was signed by Governor Y.A. Yevdokimov by Decree No. 8470 325-III of 04.09.2002. I have to point out that this was the first decision of its kind, which tells about the new attitude to biological diversity and its conservation and investigation.

Thus respectable work was carried out by scientists, specialists and different officials. The publishing house staff handled the manuscript with utmost respect and scrupulousness. They went through all books of this kind, chose the due parameters, arranged all the material in a uniform manner, and did a lot of extra work to check the text, to prepare the indices and to complete the tables.

It was rather complicated to carry out the work, as the number of authors, editors and reviewers amounted to 40 persons living in different places and constantly disappearing on field surveys or business trips, but also because of the delays or speed-ups, which took place while the manuscript was being prepared for print. The book is illustrated by artist A.M. Makarov, who also illustrated the Red Data Books of Karelia and Eastern Fennoscandia. We naturally tried to avoid repeating the illustrations and to choose species which do not usually appear in other publications. We did not quite succeed in this, but, nevertheless, some drawings, e.g. that of the liverwort, appear for the first time.

The Pasvik Nature Reserve was the co-ordinator of the Red Data Book project, and N.A. Konstantinova (Polar-alpine Botanical Garden-Institute of the Russian Academy of Sciences), A.S. Koryakin (Kandalaksha Nature Reserve) and O.A. Makarova (Pasvik Nature Reserve) were the editors-in-chief. V.Y. Prisyazhnyuk, Head of the Red Data Book Laboratory of the VNIIPrirody Institute, agreed to act as manuscript reviewer.

Total amount of rare species

The total amount of rare species in the Red Data Book of Murmansk Region is much higher than in the first publications. New information about the plant and animal biodiversity of the region was used, but also the status of some species has been revised, and the rare species from the Red Data

Book of Russia had to be included in the list as well. At the same time it must be pointed out that different groups have been studied to very different extent.

The inventory of terrestrial vertebrates and vascular plants has almost been accomplished, while insects, molluscs, mushrooms and especially algae clearly need further studying, and quite a lot of energy will be needed to improve the situation in the future. It has to be mentioned that in the future keen attention will have to be paid on the definition of the species' rarity category. We were not able to avoid the category of "bio surveillance" (species needing constant monitoring of their status).

The total amount of species included in the Red Data Book of the Murmansk Region amounted to the imposing number of 653. There are 7 mushroom species, 131 lichen species, 424 plant species and 91 animal species in the book. As far as rarity is concerned, most species belong to category no. 3 (vulnerable) and they "need biological surveillance". The risk of extinction is quite realistic for 69 vascular plant species, 32 moss-like species, 17 lichen species and 19 animal species. As to species not needing special protection, the *Bryoria fremontii* should be pointed out, because it is included in a Red Data Book of a higher rank (the Red Data Book of USSR), but at the same time it is quite common and widespread in the Murmansk Region.

It is impossible to list all the species here. It can only be mentioned that there are 225 species descriptions in the book, 222 of which are equipped with maps where the location of the plant is shown. 129 descriptions are illustrated, and the total amount of drawings with the headband copies included amounts to 154.

The quality of the paper, cover, printing and overall design of the book is as high as that of the previous books of the same class (The Red Data Books of Karelia and Eastern Fennoscandia). The book will be printed in the Pravda 1906 printing house in Saint Petersburg in autumn 2003.

The edition of 5000 pieces was decided already at the phase of elaborating of the normative documents. There will be enough copies to be sent to libraries, educational institutions, administrative authorities and scientific and economic organisations, and also for international purposes.

It is necessary to look into financial issues, as well. The work of a great number of specialists, the manuscript, pre-print preparations and the print were mainly financed by the Russian side, i.e., the Murmansk Region Government and the Murmansk Region Department of Natural Resources and Environmental Protection of the Russian Ministry of Natural Resources. However, the finances were not sufficient to print the whole edition. Financial support was requested from international partners, and the Ministry of the Environment of Finland, the Norwegian Directorate for Nature Management and the Västerbotten County Administration of Sweden responded positively. Together, we all managed to accomplish this very important document, which symbolises a new understanding of the importance of protecting biological diversity. This is an issue which cannot be handled regionally; it reached an international scale long ago. We must go on with our co-operation to protect the living nature of the North, and the next step should be the new project of the Red Data Book of the Barents Region.

There are naturally certain shortcomings in the book. But this book reflects the level of knowledge at the end of the 20th century. Now we have a platform where to start a new job, bearing in mind the inaccuracies and gaps in the information and also the achievements made in assessing the level of species rarity.

O.A. Makarova

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New Book about Moss Flora of Central European Russia Published

Mosses are small plants and therefore they look all alike for a non-specialist. At the same time in Northern countries the number of moss species is just a little less than that of flowering plants. Mosses play an important role in the biosphere, managing air and soil moisture and making peat accumulation possible; the by-product of the latter is also the oxygen in the atmosphere. The studies of mosses are also important for the general understanding of many aspects of nature. In Russia there are not many handbooks on mosses and the last ones were printed a long time ago, so they are practically not at all available. We decided to fill this gap and prepare a book which makes it possible for anyone interested to enter the world of these miniature and wonderful plants. The printing of the book was supported by the Russian Academy of Sciences, the Russian Committee for Publications and the Finnish Ministry of the Environment.

The first volume of “Moss flora...” includes 364 species and 5 varieties of mosses growing in the central part of European Russia (the North and the Caucasus are not included, whereas the most part of the Ural is). Each species is characterized in respect of its morphology, ecology and distribution (in 43 Provinces/Republics in this area), and the illustrations are based on regional collections. The peristome structure of each family is shown in SEM pictures. Systematic arrangement is given according to the most recent analysis based on both morphological and molecular data.

[The author of the family Bryaceae is V. I. Zolotov and of the rest – M. S. Ignatov & E. A. Ignatova]

Ignatov, M. S. & E. A. Ignatova 2003. Moss Flora of the Central European Russia. Vol. 1: Sphagnaceae – Hedwigiaceae. Moscow: KMK Scientific Press Ltd. P. 1-608. (Arctoa vol. 11, suppl. 1).

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Internet-service for Russian Forestry www.idanmetsatieto.info



Information about Russian forest sector and wood trade can be obtained concentratedly from the internet-service "www.idanmetsatieto.info". Service has been developed in the project "Expertise in Russian Forestry" coordinated by the Joensuu Research Centre of the Finnish Forest Research Institute.

Internet-service includes extensive package of basic information about Russian forest sector and wood trade, forest legislation, news service, statistics, links, etc. In addition, service presents examples of Russian forest maps and information about their producers. Among the numerous downloadable files there is telephone book of forestry enterprises and organisations in North-West Russia including over 300 connections.

The service contains meeting point for Finnish and Russian enterprises. It includes company register, where can be added information about forestry enterprises and organizations. In addition there is an information board for announcements. Aim of the meeting point is to facilitate cross-border networking especially of the small and medium sized enterprises.

It is worthwhile to visit the pages often, since the news service is following Russian and Finnish news and information sources constantly. In addition topical sector includes articles, for example forestry communication of the Ministry's of Foreign Affairs representative in Moscow. The service is completed continuously and developed on the basis of feedback from its users.

The project "Expertise in Russian Forestry" produces information about Russian forestry and wood trade in easily accessible forms. In addition to the internet-service project is offering information through service points in Joensuu and Kajaani. The project is financed by the Interreg III A Karelia –programme and the State Provincial Office of Eastern Finland in years 2002-2004.

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