



Tacis Project ENVRUS 9704

Proposal for the establishment of Koitajoki-Tolvajärvi National Park

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Preface

This report contains the documents, which, according to Russian legislation, are needed for the establishment of the Koitajoki-Tolvajärvi National Park: Feasibility Study for the establishment of the NP and the Proposal for the Plan of the Koitajoki-Tolvajärvi National Park including an Action Plan for the five first years of the NP. After handing over the documents to the Government of the Republic of Karelia, together with the Tourism Strategy of the Green Belt and Socio-economic Assessment of the Establishment of New National Parks in Karelia, the future of the National Park is in the hands of the Republic and the Russian Federation.

The preparation of this plan has been possible due to funding from the European Union's Tacis Programme. Support to the Koitajoki-Tolvajärvi National Park was one of the activities in the project Karelia Parks Development, which was implemented here in 1999-2001. During the project, the Municipal Enterprise of Tolvajärvi was established by the local administration of the Suojärvi District. Its main task is to develop and maintain the park infrastructure, services and tourism before the National Park is officially established. The Municipal Enterprise was also the local recipient of the training and equipment, which is needed for the park management and which was received from the Tacis project. However, it is only a transition period organisation, which will be replaced by the National Park administration.

On behalf of the consortium running this project (the consortium includes Metsähallitus, Finnish Environment Institute, Indufor Oy and Kampsax International A/O), I wish to thank Viktor Kolomytsev as the author of this plan, and all the Russian and foreign experts, who have contributed to the preparation of the plan and in other ways supported the development of this unique territory to an internationally recognised national park.

Jouko Högmänder
Team Leader of the Tacis Project Karelia Parks Development ENVRUS9704
April 20, 2001

Abstract

The Koitajoki-Tolvajärvi proposed national park is situated in the western part of the Karelian Republic in the Suojärvi District. The protected area would be 76 900 ha and it belongs to Kuolismaa, Tolvajärvi and Vegarus forest ranges. The buffer zone is proposed to cover 58 300 ha, within the same forest ranges. The Park extends from the 62° 40' to 62° 10' N and 31° 20' to 31° 40' E and adjoins the Finnish border in Koitajoki area.

The National Park will consist of two parts: the Koitajoki area with large mires and fairly untouched forests close to the Finnish border and the Tolvajärvi area (currently a Partial Nature Reserve, zakasnik) with many lakes and eskers with pine forests dominating.

Forest land covers 19 349 ha (60%) of Koitajoki area (table 1). Non-forested land (13 039 ha, 40%) is mostly covered by mires (31,6%) and lakes and rivers (6,7%). Over the recent years forest crops have been growing on an area of 929 ha. Mires mainly represent the non-forested area, which cover 25% of the National Park's area. Lakes and rivers cover about 10% of the Park's area (table 2).

Forests in the Koitajoki – Tolvajärvi National Park are dominated by young stands (43%) but mature and over-mature stands occupy 24,4% of the forestland. The proportion of middle-aged stands is 16,8% and that of maturing stands is 15,3%.

The total stock of timber adds up to 1 900 000 m³. The total stock of mature and over-mature stands in the 2 km broad frontier strip is 600 000 m³, and in the rest of the Park's territory is 260 000 m³. The stock of one hectare in the frontier strap makes up to 233 m³, in the Kuolismaa forest range – 117 m³. Thereafter, mature and over-mature forests cover 50,9% of the forestland in the 2-km frontier sector while in the rest territory they cover only 15,2%. The ratio of young stands for these territories is 1,4% and 57,1% respectively, and for middle-aged stands it is 32,2% and 11%.

Thus, old-growth forests are mainly concentrated on a 2-km stretch near the state border. The degree of paludification in this area is only 17%. As it was mentioned above, a large-ridge locality is located here, which originated as a result of magmatic elevation with strongly broken terrain. While describing the forest situation in the park it is worth pointing out that at present about 40 % of the forestland is presented by maturing and overmature stands with a structure similar to primeval taiga habitats.

Tolvajärvi was protected as a so called Crown Park during 1919-1939 when the territory was a part of Finland. The park area was, at that time, only 12 ha. The first proposal on establishing a Russian national park was done by the Ministry of Environmental Protection in Karelia in 1993. Since 1995, the southern part of the proposed park, the Tolvajärvi area, has the status of a partial nature reserve for landscape protection (landscape zakasnik). It covers an area of 41 900 ha.

A summary of the values of the biodiversity, history and culture in this territory can be presented as follows:

- Koitajoki - Tolvajärvi region is located within the White-Sea - Baltic Watershed. Two dominant South Karelian middle-taiga landscapes common for East Fennoscandia meet in the area. In the western part of Middle Taiga, i.e., in the Suojärvi District, these landscape types have preserved well. The area is optimal for protecting and exhibiting these landscape types
- Tolvajärvi lake system surrounded by eskers, and Koitajoki river flood lands represent the two landscapes covering about a half of the southern Karelia. They are valuable for nature and recreational values. Almost all middle taiga features of the Eastern Fennoscandia from Karelian Isthmus to the Scandinavian Peninsula and Murmansk region are available in the area. Nature with similar characteristics has not been protected anywhere in the middle taiga sub zone of Karelia.
- Vascular plant flora bears a distinct middle-taiga image with slight features of both southern and northern flora. The flora is very poor and typical to taiga zone dominated by oligotrophic habitats. The number of vascular plants is 324 for the Koitajoki and 372 for the Tolvajärvi area, of over 1400 species known in Karelia. Flora protection value of the areas is low. However, there are 132 species of mosses (30% of the Karelian bryophyta) and the protection of mires will save *Sphagnum molle*, a red listed moss endangered in Fennoscandia.
- Mammal fauna of the national park consists of 42 typical taiga species, 12 of which are game species. Koitajoki area might be important in conservation of forest reindeer on the southern margin of its distribution in Fennoscandia.
- The breeding bird fauna includes 122 species in Koitajoki and 146 species in the Tolvajärvi area. The total number of bird species encountered in the national park is 174. The Red Data Books of Russia, Karelia, and East Fennoscandia have enlisted 18 species found from the park. The total number of rare and endangered bird species from the park is 20. Also a relatively high density of game birds, e.g., capercaillies and waterfowl has been registered.

- The flora and fauna of both core areas are similar to each other and common for taiga ecosystems dominated by oligotrophic habitats. In relation to this, the proposed National Park could be recognised as a sample of the European typical taiga in need of protection.
- The population of the large growing vendace from the Tolvajärvi cluster of lakes could be used for the introduction of this species. The species is interesting from a scientific point of view and calls for special measures to protect the local population of vendace.
- A great number of rare and endangered insects have been recorded in the old-growth and resin tapped forests of the territory.
- There existed a protected area by lake Tolvajärvi from 1913 until 1939. The area was a part of Finland at the time. Tolvajärvi area is famous for its rune-singing traditions and monuments of history, including numerous pieces of evidence about battles taking place during World War II.
- In Koitajoki-Tolvajärvi National Park, there are 13 geological and 16 geo-morphological monuments of nature and 9 zoologically valuable biotopes. These biotopes are crucial reproduction sites for both common and endangered birds. Kalatonsuo mire is a noteworthy peatland area.
- Tolvajärvi with surroundings has a high recreational value. The pine forests are mainly easy to hike, lakes and rivers make up an attracting network for visitors interesting canoeing, moving by rowing boat and fishing.
- Tolvajärvi-Koitajoki NP will be a part of the core-zone of the International Biosphere Reserve. Preparations for the establishment of the BR is in process in the Russian – Finnish co-operation between the states in the field of nature conservation.

The new proposed border stations, Haapovaara and Ruhovaara, are located in the territories of Koitajoki–Tolvajärvi. Restricted traffic, mainly for timber transfers, exists but also some visitor groups have crossed the border with special licenses.

Formerly, the territory of the proposed national park was inhabited by orthodox Karelian people. Many famous bard singers, e.g. Vornanen and Shemeikka families, lived here. A memorial for Karelian bard singers was raised in 1929. In 1939, a hotel was constructed on an esker between Tolvajärvi and Hirvasjärvi lakes. In the 1920-1930s, the area was developing fast as a tourist resort because of its beautiful lake-esker landscapes. However, this development ended when the war broke out in 1939.

During the Winter War, heavy battles were taking place. The villages were evacuated and burned, the hotel was destroyed, the memorial disappeared and, finally, the territory was moved to the Soviet Union regime. A small Russian village was inhabited by Tolvajärvi lake until 1978 when people moved to larger villages.

In 1999-2000, some roads from Värttilä and Raikonkoski to Tolvajärvi were improved in order to facilitate tourism. Campsites, fireplaces with open shelters and info boards were set up. Broken bridges and poor condition of roads are still impeding the use of the territory. The Tolvajärvi partial nature reserve is managed by the "Municipal Enterprise of the Tolvajärvi", owned by the Suojärvi District. The Koitajoki-Tolvajärvi NP is in the middle of the proposed chain of nature reserves called the "Green Belt" of Fennoscandia.

The Koitajoki – Tolvajärvi National Park is adjacent to the Russian – Finnish border and it is a prospective part of an International Biosphere Reserve located on both sides of the border in Russian and Finnish Karelia. In Finland, attached to the border, there is the North Karelia Biosphere Reserve consisting of two National Parks – Patvinsuo (with the area of 60 km² of which 60% is occupied by mires) and Petkeljärvi (6,3 km²) - and a number of other protected areas.

The most serious threats to the proposed park are cuttings, which would remarkably decrease the value of the territory for nature conservation and recreation. Also wild tourism, which is problem already now, is demanding measures before forest fires, wild constructions and other illegal activities destroy nature.

Withdrawal of natural resources entailed by establishment of the National Park will first of all concern timber harvesting. The existing estimated allowable cut in the Suojärvi forest enterprise (within the Suojärvi District) is 846 000 m³. As a result of establishment of the National Park, the theoretical annual allowable cut, a kind of roof for cuttings, will be reduced by 45 400 m³ in the Suojärvi district.

However, in the long run the National Park will offer **job opportunities** not only for the staff of the park, but a number private enterprises nearby it. The establishment of the NP will create new livelihoods in a district, which today is suffering of livelihood structure based only on forestry.

According to the proposal for the NP establishment, **the rights of local people** to use the natural resources of the park, would not be greatly affected. The picking of berries and mushrooms

as well as fishing will continue as earlier. Minor changes in hunting are proposed. Strictly protected zones will be closed for all visitors.

Functional zoning of the NP will be accomplished. Only 4,4% of the National Park would belong to the strictly protected zone with no access and 5% to the special protected zone. In the latter one guided tours are possible.

The plan for **the facilities and services** is presented. The office of the NP is located in Suojärvi town. A small Visitor Centre will be constructed in the Tolvajärvi village. Seven information points, six camping grounds, twelve hiking trails and a number of water routes and winter routes are proposed to be created.

In **the park administration** 43 permanent employees and a number of temporary workers are needed to keep the park running. It is proposed that the staff would be taken gradually during the five first years. The construction of the park is estimated to need investments of 33 million Rubels (equal to 1,3 million Euros) during the ten first years, after which the need for investments will lower. The largest proposed investments are needed in repairing the road network and bridges, construction of accommodation for tourist, construction of the Visitor Centre and park office.

During the five first years of the NP, the annual expenses are estimated to grow from 5,4 million to 8 million Rubels (equal to 216 000 – 320 000 Euros) and income from 370 000 to 1,1 million Rubles (equal to 15 000 – 44 000 Euros).

Before the establishment of the Koitajoki-Tolvajärvi National Park, the Municipal Enterprise Tolvajärvi will take care of the activities. It has been the local recipient of the Tacis Project Karelia Park Development ENVRUS9704 and got a good start in developing the park infrastructure and tourism already there, before the official establishment of the NP.

Introduction

The territory of the proposed Koitajoki-Tolvajärvi National Park (NP) is well known by scientists and nature conservationists, but only in the Suojärvi and Sortavala districts is the public familiar with the area. The Koitajoki – Tolvajärvi area belonged to Finland until the 1940s and Finns still frequently visit the area. The area of the park has always been sparsely populated and nowadays it's uninhabited. The history is rich, though, and from the medieval ages until the end of the World War II, almost every historical event connected with Russian-Swedish relations and in the 20th century Russian-Finnish relations, were closely related to the area. This area is also famous for its rune-singing traditions and the unique beauty of the nature. Between 1913-39 in Tolvajärvi there was the so-called crown park established as an early nature reserve. The revival of the national park is well justified.

The Koitajoki-Tolvajärvi NP is in the middle of the proposed chain of nature reserves called the "Green Belt" of Fennoscandia. The Northern part of the park borders the westernmost part of the Russian border and also the European conjunction of the north and middle taiga is there. Another important aspect of the nature is that practically the whole area belongs to the River Koitajoki catchment and is situated in the western part of the White Sea/Baltic Watershed.

The nature of the area has stayed in a primeval state due to the location near the border and its remoteness from settlements, a scarce population and, at present, no human activity. Even the rare cuttings do not spoil the impression because the forest has regenerated well.

In the middle of the 1990s, experts from the Karelian Research Centre of the Russian Academy of Sciences proposed 75 000 ha for a national park to be established in the Koitajoki and Tolvajärvi areas. The Government of The Republic of Karelia supported this initiative. Co-operation between Russia, Finland and the EU in the sphere of nature reserve development promoted in 1997 a complex investigation of the proposed park to define the best sites.

Financial support within the framework of the Tacis Project ENVRUS 9704 "Karelia Parks Development" has enabled additional research of the area in the year 2000. Also the establishment of the infrastructure of the future national park has been started with the help of the Tacis project: there is a park office in the town of Suojärvi, a car and computers have been purchased. The Tacis Project also trains specialists to work with nature reserves and develop tourism strategies in the Green Belt of Fennoscandia, because nature conservation, ecological education and ecological tourism are inseparable nowadays.

The initiative of the Koitajoki-Tolvajärvi National Park has been supported by a Suojärvi district ordinance approving the borders of the proposed park. A national park is a new idea in the social-economic and cultural aspects of the regions development. A National Park is organised mainly to protect natural and cultural heritage, but - however strange it might sound - this should lead to settling and development of uninhabited areas in Karelia. When this happens, one of the socio-economic goals of the National Park will be achieved. The prospects of tourism development in the area are good due to the Värtsilä international border checkpoint situated nearby, and relatively good roads.

The proposals for the establishment of the national park is based on the data from the following experts of the Karelian Research Centre of the Russian Academy of Sciences and other Russian research institutions:

Institute of Biology:

A.V. Artemiev, V.V. Belkin, S.I.Grabovik, P.I.Danilov, S.I.Grabovik, T.Yu.Diatchkova, V.Ya.Kanshiev, O.L.Kuznetsov, A.I.Maximov, P.N.Tokarev, V.A.Markovski, N.V.Lapshin, V.Pavlov, V.Pervozvanski, F.F.Feodorov

Institute of Water Problems of the North:

L.I.Vlasova, S.F.Komulainen, V.I.Kukharev, A.V.Litvinenko, P.L.Lofovik, A.V.Riabinkin, Yu.A.Salo, A.V.Freindling, T.A.Tchekryzheva

Institute of Geology:

V.Ya.Gorkovets, A.D.Lukashov, M.B.Rajevskaya

Institute of Forest:

T.V.Belonogova, O.A.Butskikh, A.N.Gromtsev, V.A.Kolomytsev, A.V.Kravchenko, V.I.Krutov, A.M.Kryshen, N.L.Litinskaya, N.V.Medvedev, R.M.Morozova, A.V.Polevoj, S.V.Sazonov, A.M.Shelekhov, A.E.Humala, E.B.Yakovlev

Institute of Economics:

T.V.Morozova, S.A.Gurova, T.B.Kozyreva, M.V.Diakonova

Institute of Language, History and Literature:

S.I.Kochkurkina

Petrozavodsk State University:

E.P.Gnatiuk

Komarov Botanical Institute (St.-Peterburg):

M.A.Bondartseva, V.M.Lositskaya

Rosgiproles Institute (Moscow):

V.M.Lukjanov, Yu.V.Dobrushin, S.V.Pochinkov, S.V.Korkina, A.V.Matveev, O.V.Shevtsov,
N.V.Trepalina, V.D.Ankudovitch, V.P.Gurvitch, O.A.Glushkova

Over the period of the preparation of the study, Vladimir Petrusov, the most competent local expert, took an active part in the work. At different stages of the preparation of the report constructive comments were suggested by international experts, of whom the great work of Timo Hokkanen should be mentioned.

Materials affording the basis of the feasibility study were discussed at Tacis-organised seminars in working groups consisting of specialists of various profiles, representatives of authorities and agencies of the Suojärvi Districts, Karelian Government, the business sector and others. Every chapter of the study was discussed many times with Jouko Högmander, the Team Leader of the Tacis Project, who also wrote chapters dedicated to the goals of the Park and the role of the Park in the protected area networking in the region. He made general editing of the text. The text was translated to English by Dimitri Titkov and Olga Tigushkina. The English version was proofread by Ray Ward.

I. Ecological and economic feasibility study of the proposed Koitajoki-Tolvajärvi National Park

1. Present and proposed legal status

Since 1995 the southern part of the proposed park, the Tolvajärvi area, has had the status of a Partial Nature Reserve for landscape protection (landscape zakasnik). Its area is 41 900 ha. The Municipal Enterprise of Tolvajärvi takes care of the territory, but it has no legal authorization as for land, waters, fishing, hunting or supervision of the territory.

The Koitajoki area is included in the Federal Program of new national parks in Russia (1994), and it would be natural to include the Tolvajärvi Partial Nature Reserve to the national park. This combination of two areas makes up the proposed Koitajoki – Tolvajärvi National Park.

The Koitajoki – Tolvajärvi National Park is adjacent to the Russian – Finnish border and it is a prospective part of an International Biosphere Reserve located on both sides of the border in Russian and Finnish Karelia. In Finland, along the border, there is the North Karelia Biosphere Reserve consisting of two National Parks – Patvinsuo (with the area of 60 km² of which 60% is occupied by mires) and Petkeljärvi (6,3 km²) - and a number of other protected areas. The area of protected core zones in North Karelia Biosphere Reserve is 14 200 ha, but the total area of nature reserves under different protection regimes is about double. All these nature reserves are fragmentary.

The establishment of Koitajoki-Tolvajärvi National Park in Russia with the area of 76 900 ha with its nuclei – the basin of the Koitajoki River and spectacular Tolvajärvi lake area – will allow to set up an internationally important nature conservation complex of wetlands and forest ecosystems typical of the north mid-taiga sub-zone of East Fennoscandia. This conservation unit will belong to the historic province of North Karelia.

Preparations for the establishment of the BR is in process in the Russian – Finnish co-operation between the states in the field of nature conservation. Some of the plans cover the whole Suojärvi and Mujezerka districts, and yet so that the proposed national parks of Koitajoki-Tolvajärvi and Tuulos would be core zones of the Biosphere Reserve. The total area of the future International Biosphere Reserve is not yet exactly known. According to the rules, the national government would submit an application to Unesco for establishment of a Biosphere Reserve.

In this case it would border to the Finnish North Karelian Biosphere Reserve, which was established in 1992. North Karelia Biosphere Reserve consists of two National Parks – Patvinsuo (with the area of 10 000 ha, 60% of which is occupied by mires), Petkeljärvi NP (600 ha), and a number of other fragmentary protected areas.

The establishment of 76 900 ha Koitajoki-Tolvajärvi National Park in Russia enables to set up an international nature conservation complex of wetlands and forest ecosystems typical of the north mid-taiga sub-zone of East Fennoscandia, within the historic North Karelia Province. The total protected area of the International Biosphere Reserve will make up almost 104 000 ha. (for the biosphere reserve concept see <http://www.unesco.org/mab/>).

2. Borders of the Park

The Koitajoki – Tolvajärvi National Park is situated in the Suojärvi District within the borders of the Kuolismaa, Tolvajärvi and Vegarus forest ranges. The total protected area of the park is 76 900 ha and there is a 58 300 ha buffer zone around it (fig. 1).

Complying with the comments on the boundaries of the proposed National Park and Ordinance of the Head of the Suojärvi Administration "Agreed Borders of the Koitajoki National Park and Its Buffer Zone" #124 of March 25, 1998, the following compartments of the Suojärvi Forest Enterprise were proposed for inclusion into the territory of the Park (see fig.1):

Kuolismaa forest range – compartments 5, 6, 11-14, 20-24, 30-34, 42-48, 146-170 with **32 400 ha of the total area.**

Tolvajärvi forest range – compartments 51-58, 69-77, 101-107, 113-118, 123-127, 131-134 with **29 500 ha of the total area.**

Vegarus forest range – compartments 16-18, 29-32, 42-45, 55-58, 68-70, 81 with **14 800 ha of the total area.**

The total forestland included in the proposed park is 76 700 ha. With small plots of the State Land Stock (farmland) added to the forestland, the protected area of the proposed Park amounts to 76 900 ha.

The buffer zone is left with the State Forest Stock, where primary cuttings (gradual with 5-year shifting period) are admitted, and comprises:

Kuolisma forest range – compartments 1, 7, 15, 25, 35-37, 49, 50, 61-68, 69 (partly), 81, 82, 102-103, 122-127, 144, 145, 171, 172 with the **total area of 27 200 ha**.

Tolvajärvi forest range – compartments 31, 39, 41-47, 50, 68, 99, 100, 112, 120-122, 130 with the **total area of 13 400 ha**.

Vegarus forest range – compartments 1-5, 15, 19, 33 (partly), 46, 59, 71, 72, 82-85, 96 (partly) with the **total area of 13 700 ha**.

Loimola forest range – compartments 1-10 with the **total area of 2 000 ha**.

The overall area of the buffer zone with slightly restricted management opportunities is 56 300 ha.

3. Nature

3.1. Geographic location, geology and relief

Koitajoki-Tolvajärvi NP is situated in the west of Karelia in the Suojärvi District (62° 40' to 62° 10' N and from 31° 20' to 31° 40'E). The park consists of two separate protected areas – Koitajoki, which lies at the Russian – Finnish border, and Tolvajärvi about 30 km south from Koitajoki. These areas are connected by a buffer zone with a restricted nature management regime. (Atlas of the Karelian ASSR, 1989) (fig. 1).

The Koitajoki and Tolvajärvi segments of the park differ considerably from each other for geology, terrain, landscape, soils, hydrology etc. Biotic assemblages – the species composition, structure of the populations of animals and plants – are largely similar. The segments have been treated separately and, if possible, compared with each other when describing the nature. In some cases the description of the segments has been combined.

The geological structure has determined the characteristics of the area's nature. The Koitajoki River comes across the Russian-Finnish Border twice. Its length on the Russian territory is 48 km. The river goes round a large massif of ancient magma, based on migmatized diorites – acid and neutral crystalline rocks.

Due to the magmatic elevation being broken by tectonic splits on the fringes, the crystalline rocks are no longer sustainable to collapse, especially in the period of the glacier actively moving, a depression of 3-4 km wide has formed (fig. 3, 4).

A lake was formed in the depression at the end of the Ice Age, and after the hauling down of waters – lake and lake-glacier plate, which at present has been presented by a valley with the riverbed of the River Koitajoki.

The complicated history of the valley formation has ended with flood-lands and terraces, which are typical for rivers of large plates in Central Russia. There are hilly terrains with absolute altitudes 160-185 m above the sea level (a.s.l.) on the banks of the river. The relative height of the hills is 20-30 m. The differences in altitude are greater within the area of magma elevation, near the Russian - Finnish border. The absolute height of the hills is 200-225 m (a.s.l.) and the relative height is 40-75 m (Fig. 5).

The Quaternary outcrops overlap the crystalline bedrock in the Koitajoki area. The outcrops were formed 11 000-12 000 years ago during the last Scandinavian glacial cover and then transformed by postglacial waters, winds, erosion and paludification processes. The depth of quaternary deposits such as moraines, glacial sand and pebbles varies from a few centimetres to 20-30 m. Lake deposits as thin sands (alevrites), clay, lake organic deposits (sapropel) and overlapping peat lands dominate mostly in the valley of the River Koitajoki. There are also glacial landforms such as drumlins and eskers in the park. Drumlins consist mainly of morainic materials. They are narrow spindle-like ridges occurring especially in the northern part of the park. Eskers consist of sorted materials and they have been formed into the channels of glacial rivers and streams, into water-glacier deltas and moraine hill localities. These forms, in general, repeat the terrain of the crystalline bedrock (Fig.3)

The geological structure in both the Tolvajärvi and Koitajoki areas is composed of the rocks of the Archei and Proterozoi Ages. These rocks, mainly different types of granites, are rich in silica and potassium, but low in other chemical macro- and microelements. The low content of base elements leads to high soil acidity, low local biodiversity and poor vegetation.

The bedrock in Tolvajärvi has a smoother and flatter surface. Therefore, geo-morphologically it determines the low ruggedness of the terrain. Vast moraine plains with slack-hilly or wavy terrain are formed of rough rocky sand and - rarely - of sand loam. The rather firm surface of the area is distracted by several long eskers (water-glacial ridges), which are considered to be sights for the proposed NP. Esker ridges and glaciofluvial deltas connected to them are best developed in the Lake regions: Tolvajärvi, Hirvasjärvi and Suuri Kuohajärvi. The height of the eskers is 15-20 m and length from 4,5 to 16 km. Elsewhere the depth of moraine deposits varies from a few centimetres to 30 metres in depressions (fig. 6).

3.2. Hydrology

The peculiar geological structure and combination of different forms of terrains have caused a complicated hydrographic net of the basin of the River Koitajoki, which includes the local water collection of Lake Luojärvi and the River Luovenjoki. The hydrographic net consists of a 48 km part of the Koitajoki River (the rest is on Finnish side), its 39 tributaries and about 115 lakes with the area of about 14,2 km². All the water area is approximately 4,5 % of the Koitajoki area (fig. 2 ,3).

Groundwaters are susceptible to pollution through soil surface. Spring waters are low acid and nearly neutral (pH 5,4-6,6) and the content of solute salts in springs and wells are low. The major components of non-polluted waters in the upper layer of soil are hydrocarbonate, sulphate, calcium and magnesium. Very often the sulphide bedrock raises the content of iron in water from 0.4 to 2.5 mg/l. There are six springs with rather low water discharge situated not far from the abandoned settlements in Koitajoki segment of the park. Three of them are near the Kuolismaa village, one is near the Lutakkavaara village, and two are close to the Ontronvaara village.

The supply of drinking water in the Koitajoki area is a problem, because both ground waters and surface waters are largely undrinkable. Surface waters are acidic (pH 4,5) and contain a high level of iron and humus. The colour is often comparable to very strong tea. The reason for this is that acidified waters with a high load of organic sediments as silt, feed local rivers and lakes. The process leads to a high rate of sedimentation and overgrowing, especially in the riversides, by *Sphagnum* and *Hypnum* mosses.

The water quality of River Koitajoki and Lake Luovenjärvi has decreased lately, and there are grounds for the assumption that the changes are caused by mire drainages in Finland. In particular, in the upper part of the Koitajoki River on the Russian side and in the Sikapuro River, the water colour reaches 350 grad. and permanganate acidity is 59 mg O/l. In the lower part of the river, where there are no economic activities nor mire drainages around, the figures reached are only half of those in the upper part of the river.

The Tolvajärvi lake system with its unique hydrographical net is the most interesting object in the region. Waters form a complex Tolvajoki river system. The main lakes of this system are Myllyjärvi, Tolvajärvi, Saarijärvi, Ylä-Tolvajärvi, Sorsajärvi and Ala-Tolvajärvi. The water flow changes direction up to 180° over a very small distance in this system. Another group of lakes join Ala-Tolvajärvi from the west through Pieni- and Suuri-Kuohajärvi, Kuikkajärvi and Taikinajärvi. The described lake-river system is pretty and picturesque, with the scenery growing more beautiful from north to south. The height of shores grows as you go southwards but the degree of overgrown shore lands decreases. So, Lake Ala-Tolvajärvi has highish, forested shores with some open rocky outcrops. There are plenty of small islands and islets on the lake. The lakes of the western group are practically similar but are a little more overgrown and have fewer islands (Lake Taikinajärvi).

Some lakes of the system have a specific hydrological regime. Due to little difference in height marks of the surface, a backward flow of water from the lower lake to the upper lake caused by wind can sometimes be observed. It is typical of the upper lakes of the system - Myllyjärvi and Tolvajärvi. These lakes have rather small catchments but a high degree of rainfall nutrition, which makes them unique.

Altogether, there are 145 bodies of water with a total surface area of 52,9 km², and about 70 streams, which are mainly the upper tributaries of the Rivers Tolvajoki and Volgajoki. The total coverage of lakes is 11% of Tolvajärvi area (fig. 2, 3). The abundance of lakes, islands, and high shores with pine stands and channels among them make an unforgettable impression on the visitor. The greatest educational and recreational values of Tolvajärvi area come through the unique sceneries and the complex network of water and landforms.

Typical for oligotrophic waters, all low colour lakes contain a low content of phosphorus. In humic waters the phosphorus content is higher, from 18 to 25 mg/l. Organic nitrogen is practically the sole source of nitrogen (0,2-0,6 mg/l) in oligotrophic waters. Nitrites and nitrates are almost absent.

The hydrochemical data proves the high natural quality of the water in several lakes and rivers of Tolvajärvi area. According to the ecological water classification Lake Tolvajärvi in its northern part, and the western group of lakes have high water quality. Water in the Southern part of Lake Tolvajärvi and in Ylä- and Ala – Tolvajärvi is good quality. Water in Juurikkajärvi and Saarijärvi is poor quality and waters of all the investigated tributaries and the River Volgajoki are low quality.

The hydrological and hydrochemical characteristics witness the fundamental difference between the Koitajoki and Tolvajärvi areas. The River Koitajoki and the Tolvajärvi lake system are the main recreational objects of the park, and in both areas they require differentiated approaches in organising the Park's infrastructure. In particular, a supply of drinking water needs to be solved in the Koitajoki part of the park.

3.3. Hydrogeology

Hydrological conditions in both the Tolvajärvi and Koitajoki areas are characterised by openness because ground and subsoil waters are not naturally protected from the surface pollution. Previously, wells were dug near former settlements and it was impossible to protect groundwaters. No information is available about the chemical composition of groundwaters or the content of radon in it. Detailed studies are needed about groundwater formation and basics of a forecast of their use and protection in the proposed NP. At the same time, it is known that the water from springs and wells has a very low mineral content, from 0,04 to 0,08 mg/l only. In accordance with the dominating components this water is identified to be of hydrocarbonate, calcium, magnesium type and it can be freely used for preparing food.

3.4. Climate

The Koitajoki – Tolvajärvi National Park is situated in the central region of Karelia, where the winters are rather cold. The temperature is below 0°C for 190-195 days a year, but the growing season, in turn, is relatively warm and during 140 –145 days a temperature of at least +5° C or higher is encountered.

July is the warmest month with the average temperature of +15° C, the coldest month is January with an average of - 10° C. The annual rainfall is approximately 600 mm. The non-frost period lasts about 90 days, which is not favourable for vegetation. The wind regime in the Koitajoki – Tolvajärvi area is peculiar with a dominance of western and south-western winds in both winter and summer. In other parts of Karelia the wind regime changes by seasons (*Resources...*, 1972, *Atlas of the Karelian Autonomous Soviet Socialist Republic*, 1989).

3.5. Soils

The Koitajoki-Tolvajärvi Park geology has a distinguished and complicated mosaic structure caused by broken terrain and a great number of soil-forming deposits. In the natural state there is a dominance of barren alluvial-iron-humus lands on light sandy and sand-moraine soil. The peat lands of the Koitajoki area occupy about 30 % of the area, 20% of the mires are transitional and transitional-raised and 10 % are of raised types. Alluvial soils are widely spread in the valley of the River Koitajoki.

Of alluvial types turf-clay soils are pervaded best under herb-sedge meadows and silt-clay soils under alder forests and coniferous forests. Stress from human economic activity has also influenced the present soil structure. The slash-and-burn agriculture promoted the formation of podzolic soils, which are rather fertile and maintained the typical characteristics under manmade meadow communities as well as in secondary forest stands, i.e., mixed birch trees with aspen and grey alder thickets. Such soils can be found near abandoned settlements and farms.

The soil characteristics in the Tolvajärvi area determine many peculiarities of the nature. The main soil-forming deposits are moraine sands and sand loams forming ridges and low hills. Peat fills the lower parts of terrains of the erosion and tectonic origin. The bottom of the soil cover is podzol: illuvial-iron sand rocky and alluvial-humus-iron sands and sand loams. Swamp soils are widespread in the area but to a lesser extent than in Koitajoki. The boggiest is the southwest part, where swamp-podzol soils as well as boggy soils are common. Peat transitional type is the most frequent among swampy soils.

3.6. Landscapes and vegetation

Landscape types used here have been determined according to forms of the terrain, their genesis, paludification rate and dominance of primeval forests (pine or spruce) (Volkov *et al.*, 1990).

The complicated geological and geomorphological structure of Koitajoki area also makes the landscape structure many-sided. The ridge-hilly terrain of denudation-tectonic origin dominates in the area. This landscape type is characterised by pine forests and 20-40 % of the area is paludified.

Four types of terrain can be found (fig. 4). The alluvial plane along the Koitajoki River belongs to the highly waterlogged valley-plane type (1) terrain. This type is rare in the central part of Western Fennoscandia. Highly waterlogged small ridge (drumlin) type (2), medium-waterlogged ridge and small hill type (3), and medium-waterlogged large ridge type (dominated by pine forest) are rather typical and widespread in the middle taiga sub-zone in Karelia (Volkov *et al.*, 1990). However, they are not found in other protected areas on the border of the middle-taiga and north-taiga sub-zones. It is also noteworthy that these terrains are situated on the White Sea/Baltic Watershed.

The Tolvajärvi area landscape structure is differentiated into two types (fig. 4). The central and eastern parts of the Tolvajärvi are considered (1) denudation-tectonic hilly and ridge-hilly, moderately paludified landscape dominated by pine forests. It is a typical landscape occupying about 15% of the middle taiga sub-zone in Karelia. This landscape has typical taiga animal species with average and low density: Hare – 10-15, Fox – 0,5-0,9 and less, Wolf – 0,02-0,05, Bear – 0,41-0,6, Lynx – 0,06 – 0.15, Capercaillie – 8,6 birds/1000 ha.

The western part of the Tolvajärvi area lies within the denudation-tectonic ridge-hilly, moderately paludified landscape (2) characterised by spruce forests (fig. 4). This landscape dominates in the mid taiga sub zone in Karelia, occupies 25 % of its area and is distributed evenly all over the area.

The landscape has relatively low density rates of mammal and bird populations, which are 1,5 – 2 times lower than the region's average figure: Hare – 10-20, Wolf – 0,02-0,05, Fox – 0,5 – 0,9, Bear – 0,41-0,6, Lynx – 0,16 – 0,25, Capercaillie – 2,3 birds/1 000 ha.

One fragment of denudation-tectonic hilly and ridge-hilly highly waterlogged landscape with pine-dominated forest can be found from the north eastern part of Tolvajärvi area. This landscape type occupies 5 % of the middle taiga sub-zone in Karelia. Water-glacial ridge (esker) complexes form the central part of Tolvajärvi area. Narrow, high and twisting ridges overgrown with pine stands set off numerous large lakes and give this area a gorgeous and unique image. Such landscape types are widespread in Karelia, but this branching lake - river system with several lakes with clear, transparent water is prominent for the whole region (Kolomytsev, Shelekhov, 1997*).

The Tolvajärvi area is unique by nature and has no analogues in other protected areas of the middle-taiga sub-zone. Firstly, it is one of Karelia's largest esker-lake complexes and, secondly, there is a multitude of contacts (borders) of typical southern Karelian landscapes which, however, contrast in structure and dynamics.

3.7. Ecosystems.

3.7.1. Forest stock

Landscape-forest studies in the Koitajoki area allow us to make a conclusion that just one of the most common middle taiga landscapes of the East Fennoscandia is presented here and is dominant in its western part (the Suojärvi District). The only exclusion is outstanding patches found along the Koitajoki lake-river system.

Table 1

Distribution of forests of the forest stock of the Koitajoki-Tolvajärvi NP

Forest Range	Forest land in ha					Forest land in % of total area
	Forest	Plantations	Burnt forest	Cuttings	Total	
Kuolismaa	19 085	87	–	177	19 349	60
Tolvajärvi	19 745	50	32	32	19 859	67
Vegarus	10 019	227	11	67	10 324	70
Total	48 849	364	43	275	49 531	
Share in % of total area	64	0	0	0		

Table 2

Distribution of non-forested land types in the Koitajoki-Tolvajärvi NP.

Forest Range	Land without forest in ha						Land without forest in % of total area
	Lakes, rivers	Mires	Roads, openings	Hay fields	Others	Total	
Kuolismaa	2 030	10 811	89	37	72	13 039	40
Tolvajärvi	4 634	4 970	72	-	1	9 676	33
Vegarus	1 016	3 398	45	-	-	4 459	30
Total	7 679	19 179	206	37	73	27 173	
Share in % of total area	10	25	0	0	0		

Forest land covers 19 349 ha (60%) of Koitajoki area (table 1). Non-forested land (13039 ha, 40%) is mostly covered by mires (31,6%) and lakes and rivers (6,7%). Over the recent years forest crops have been growing on an area of 929 ha. Mires mainly represent the non-forested area, which cover 25% of the National Park's area. Lakes and rivers cover about 10% of the Park's area (table 2).

The Park embraces forest land of compartments 144-170 of a 2 km frontier stretch (7125 ha), which adjoins the forest fund of the Kuolismaa forest range of the Lahkolampi timber industry enterprise and compartments nr 1, 5, 6, 11-14, 20-24, 30-34 and 42-47 of the Kuolismaa forest range on an area of 25523 ha. Pine stands prevail in this area (table 3).

Table 3

Coverage of various forest stands in the Koitajoki area

Forest type	Ha	%
Pine	11770	60
Spruce	6506	33,1
Deciduous (birch)	1348	6,9

Forests in the Koitajoki – Tolvajärvi National Park are dominated by young stands (43%) but mature and over-mature stands occupy 24,4% of the forestland. The proportion of middle-aged stands is 16,8% and that of maturing stands is 15,3%.

The total stock of timber adds up to 1 900 000 m³. The total stock of mature and over-mature stands in the 2-km frontier strip is 600 000 m³, and in the rest of the Park's territory is 260 000 m³. The stock of one hectare in the frontier strap makes up to 233 m³, in the Kuolismaa forest range – 117 m³. Thereafter, mature and over-mature forests cover 50,9% of the forestland in the 2-km frontier sector while in the rest territory they cover only 15,2%. The ratio of young stands for these territories is 1,4% and 57,1% respectively, and for middle-aged stands it is 32,2% and 11%.

Thus, "old" forests are mainly concentrated on a 2-km stretch near the state border (fig. 7, 8). The degree of paludification in this area is only 17%. As it was mentioned above, a large-ridge locality is located here, which originated as a result of magmatic elevation with strongly broken terrain. While describing the forest situation in the park it is worth pointing out that at present about 40 % of the forestland is presented by maturing and overmature stands with a structure similar to primeval taiga habitats (fig. 7).

The forestland of the Koitajoki sector amounts to 30 000 ha (table 1) now, with the total stock of timber at roughly 2,96 mln m³, of which mature and over-mature stands make up 860 000 m³ and maturing forest – 210 000 m³. On a larger part of the sector where young stands dominate (table 1), the timber stock is not big – within 100-150 m³/ha. The non-forested land in this area is presented mostly by marshland. The marshland covers a lesser area than in the Koitajoki sector in general – about 18%.

3.7.2. Forest ecosystems

Pine forests cover the majority of the Koitajoki area. In general they are related to the group *Pinetum Hylocomium* where the super-soil floor is prevailed by brown forest mosses in combination with *Vaccinium myrtillus* and *Vaccinium vitis-idaea*. *Vaccinium vitis-idaea* pine forests occupy about 50 % and *Vaccinium myrtillus* pine forests - 28 % of the forestland. Only 4,5 % of the pine forests belong to the lichen (*Cladonia*) type. These forests are situated on hills and ridges.

There are several types of pine forests on paludified land, which is a very important aspect for the ecosystems diversity. The forests on paludified land belong, e.g., to grass-sedge and *Sphagnum* type and cover 14,8 % of the forested land.

Spruce forests are mainly (> 50 %) of *Vaccinium myrtillus* type. The share of *Vaccinium vitis-idaea* spruce stands is 23 %. These stands have apparently been developed from *Vaccinium vitis-idaea* type pine forests after the removal of pine with selective cuttings. *Vaccinium myrtillus-Sphagnum* type forests cover 15 % and herbaceous-marshy stands 7 % of the forested land.

There are picturesque fragments of "strip" pine forests along the high banks of Koitajoki River. Old spruce stands grow mainly in low-lying, fertile and often waterlogged parts of the terrain. The ground vegetation of the spruce forest is far richer than that of the pine forest. The spruce forest belongs mainly to grass and *Equisetum-Sphagnum* group.

Long-term cuttings have impacted the even age of the forest, especially in dominating non-waterlogged pine stands. The majority of old growth spruce and pine stands are considered primeval forests since they have been less intensively cut due to their low productivity. Only a few and scattered, small sized fragments of forest stands with the age of more than 100 years can be found from the proposed national park (fig. 7, 8).

Some of these forest stands are considered primeval. According to the modern requirements" to protected areas, this will decrease recreational and environmental opportunities of this particular part of the park. However, the natural forest regeneration is, in general, successful and after reaching the age of 100 years the forests have practically reached natural conditions.

Pine forest prevails on mineral and waterlogged areas in the eastern and central parts of the Tolvajärvi area (fig. 4). Pine stands belong to *Vaccinium myrtillus* and *Vaccinium vitis-idaea* forest types. *Cladonia* and *Calluna vulgaris* pine forests occur in the north-eastern and southern parts of the Tolvajärvi area, where moraines are thinner and less fertile and outcrops are common. Spruce-dominated forests are rare in the eastern parts of Tolvajärvi and mostly concentrated along the stream banks.

The western part is dominated by *Vaccinium myrtillus* type spruce forests occurring on more fertile loam moraine soils. Old growth pine stands relate to sandy soils of eskers (*Vaccinium vitis-idaea* pine forests), and to marshland (*Sphagnum* pine forests).

Clear and selective cuttings have transformed forests in all landscape types over the Tolvajärvi area (fig. 6, 8). The mature and old growth stands aged 100 years and over are scattered and small sized, only 5 to 70 ha. The largest old growth stands are remote places far from the roads and also on waterlogged lands (fig. 8). Natural forest regeneration is successful on pine cutting plots – pine and pine-deciduous young stands spring up.

3.7.3. Forest fires

Moderately-paludified pine-dominant landscape of the both parts of the Koitajoki – Tolvajärvi National Park has a specific natural forest fire regime (fig. 4). In general, a forest fire occurs on peat lands approximately once a century. These fires have enabled pine to achieve dominance in practically all areas. The fires, however, did not reach central parts of the mires and small areas along the streams. These have been the refuge for spruce forest.

Clear and selective cuttings have been used practically all over the Tolvajärvi area in spruce dominated, moderately waterlogged areas (fig. 4, 8). Approximately half of the area is covered by young mixed stands of spruce and deciduous trees. Pine stands are rare. Young spruce stands usually grow under the shelter of pine and deciduous forests. Spruce will inevitably displace pine in *Vaccinium myrtillus* and similar types of pine habitats without the help of forest fires. Before intensive human activity started in primeval forests, catastrophic droughts inflicted forest fires twice a millennium (Volkov et al. 1990, Gromtsev, 1993, 2000).

3.7.4. Forest pathology

No centres of fungul diseases or pest outbreaks leading to drying-out have been recorded in the Koitajoki area and the pathology situation was found satisfactory. No research has ever been done right on the territory of the proposed park.

In compartments 72 and 73 of the Tolvajärvi forest range sulphuric acid has been used as a stimulator for extracting resin from pine trees. The phytosanitary position of the tapped trees was found unsatisfactory because the trees decayed from the scars infected with peripheral rot *Antrodia serialis*. These trees are prone to falling down and there are already plenty of windfalls. Bark beetles *Ips typographus* and *Pityogenes chalcographus* are met mainly on dead pine trunks. Also, rare pine

trees have been infected with *Endocronartium pini* and *Phellinus pini*. In general, the phytosanitary state of the non-tapped forest stands is satisfactory.

3.7.5. Mire ecosystems

Mires and waterlogged forests together with the rivers and lakes are the dominating ecosystems in the unique Koitajoki river valley. These ecosystems also define the protection values of the Koitajoki part in the proposed Koitajoki – Tolvajärvi National Park (fig. 2, 3). Mires are in natural state, while the majority of them in adjacent Finnish areas have been ditched for agriculture or forestry. Paludification varies from 10% in hilly areas to 80% in the valley of the River Koitajoki (fig. 2, 4).

Eutrophic and eutrophic-mesotrophic herb rich-sedge bogs and sedge bogs (associations with *Salix lapponum*, *S. phylicifolia*, *Calamagrostis canescens*, *Carex rostrata*, *C. cespitosa*, *C. aquatilis*, *C. lasiocarpa*, *C. acuta*, *Comarum palustre*, *Juncus filiformis*) occupy the banks of rivers and lakes in a narrow patch. The moss layer of these mires is dominated by *Sphagnum fallax*, *S. flexuosum* and *S. squarrosum*.

Mesotrophic and meso-oligotrophic sedge and cotton grass - *Sphagnum papillosum* mires are located farther from lakes on the first flood-lands terrace of the Koitajoki River. Their areas vary from 50 to 200 ha. Peat depth varies from 3 to 7 m, very often there also is a layer of sapropel, i. e. lake silt. In the centre part of the marshland, ridge – flark, shrub - *Sphagnum papillosum* communities with *Sphagnum fuscum*, *S. magellanicum*, *S. papillosum* on hummocks prevail, and on swamp areas communities with *Eriophorum vaginatum*, *Carex pauciflora*, *C. rostrata*, *C. limosa* or *Scheuchzeria palustris* (*Sphagnum balticum*, *S. majus*, *S. jensenii*, *Sph. fallax*, *Sph. pulchrum*) are dominant.

Oligotrophic-sphagnum and shrub-sphagnum mires with ridge-flark or hummock-flark surface are typical for the drumlin landscape on high-gypsometric layers. These mires are extending to the waterlogged valleys in the south of the park. The oligotrophic mire area varies from 50 to 200 ha, and the peat layer depth from 2 to 7 m. The upper layer of peat is from 1 to 3,5 m. Very often the upper layer of peat covers mineral bottom, which means the barrenness of soil conditions typical of this area in general.

The super-soil floor of ridges and hummocks on the oligotrophic mires is prevailed by herb-shrub-*Sphagnum papillosum* communities. The flarks are dominated by *Eriophorum vaginatum* – *Sphagnum balticum* and *Scheuchzeria palustris* – *Sphagnum balticum* communities. Hypoarctic flarks on the *Sphagnum lindbergii* moss cover is a peculiar feature of this type of mire as well as Atlantic-related species (*Sphagnum cuspidatum*, *Sph. Papillosum* and *Rhynchospora alba*). The same feature was marked in the adjacent part of Finland, too (Tolonen, 1967; Kuznetsov and Maksimov, 1995).

Mire ecosystems of the Koitajoki floodplain are rare in East Fennoscandia and worth protection. The hydrology of the Koitajoki River depends on mires and simultaneously the river and its tributaries influence the floodplain parts. The drainage of mire floodplains would obviously destroy the natural ecosystems and refuges of migratory birds. Also the hydrology and hydrochemical composition of the river would change detrimentally.

The degree of paludification is about 10-45 % in the Tolvajärvi area. The ridge - esker area and the areas by lakes in other landscapes are least waterlogged (fig. 6). Ombrotrophic (raised) ridge - hollow eccentric mires are the most common. The area of individual mires varies from 230-240 ha. Unlike in Finland, most mires in the Tolvajärvi area are in their natural state. The vegetation of oligotrophic ridge-hollow surfaces is similar to that in the North Karelia Province (Finland).

Vegetation in ridges and hollows of oligotrophic mires is prevailed by communities where *Calluna vulgaris*, *Betula nana*, *Chamaedaphne calyculata* and *Rubus chamaemorus* are the most common species. The sphagnum layer consists of *Sphagnum fuscum*, with mixture of *S. angustifolium* and *S. magellanicum*. Flarks are occupied by *S. balticum* or *S. majus* only. The grass layer is dominated by *Eriophorum vaginatum*, *Scheuchzeria palustris* and *Carex limosa*. Also, pine-shrubs-sphagnum mires with a carpet of *Sphagnum angustifolium* are widespread. Aquatic mires usually have communities of *Carex lasiocarpa*, *Comarum palustre*, *Menyanthes trifoliata*, *Phragmites communis* and *Sphagnum riparium*. *Lycopodiella inundata* is an Atlantic species and rare in Karelia, but it has been found in the Tolvajärvi area.

The majority of the other types of mires are in the meso-oligotrophic phase and covered by clear *Sphagnum* floor. They are characterised by an entire *Sphagnum* cover. The mires, especially in the eastern part are both oligotrophic and eutrophic, open or sparsely wooded and have many different plant communities (Kuznetsov, Tokarev, 1997*).

Cranberry (*Vaccinium oxycoccos*) yield is always low – about 0,2 kg/ha - because of the diffusion of its most productive bushes across the surface of mires. Blueberry (*Vaccinium myrtillus*) yield is

higher and varies from 50 to 100 kg/ha. Cloudberry (*Rubus chamaemorus*) grow in the pine-shrubs-sphagnum forests. Fruiting of cloudberry is very occasional.

Mires and waterlogged forests are not favourable for widespread recreational use. At the same time, the recreational values of open mires in the taiga zone are in viewing of vast expanses and in habitat diversity. Mires as well as lakes, but to a lesser extent, are essential elements in displaying scenery and landscapes. Berry gathering in mires is an important seasonal recreation. It may be allowable in the park excluding the closed zones. The Koitajoki mire ecosystems are considerably valuable for scientific tourism development.

3.7.6. Meadows

Meadows in the national park are mostly anthropogenic, i.e. they are formed on former slash-and-burn sites and around settlements resulting from cultivation, haymaking and grazing (table 2, fig. 2). Only along the banks of the River Koitajoki natural communities with *Calamagrostis lanceolata* association form patches (first metres of the riverside). Over recent decades most meadows have either been abandoned or they have been mowed only occasionally. Mainly, they belong to *Deshampsia cespitosa*, *Agrostis tenuis*, regular field and herbaceous in different phases of degradation. The Koitajoki area has been populated since the 13th century but, notably, abandoned and old meadows are now rapidly growing over with deciduous trees (grey alder, birch, rowan, willow).

3.7.7. Unique ecosystems

Wetlands in alluvial plain and ridge (drumlin) localities of the Koitajoki area and esker (ridge)-lake localities in the Tolvajärvi area are the unique ecosystems in the Koitajoki-Tolvajärvi National Park (fig. 2, 4). They are also considered to be the most vulnerable in the area. Extensive economic activities would diminish the value of the unique nature.

3.7.8. Nature processes

Paludification, i.e., vertical and horizontal growth of existing mires, is a part of the natural dynamics. In the Koitajoki River valley and in the small-ridge (drumlin) area paludifiable land is scarce because the maximum water point in waterlogged areas has already been reached. In two other types of areas (medium-ridge and large-ridge localities with an average degree of paludification) the mires grow horizontally only 10 m per thousand years. Overgrowing of waters is rather active.

Also afforestation of former openings and the natural dynamics of old forests maintaining the uneven-aged forest structure are important natural processes in the area.

The specific features of the Koitajoki-Tolvajärvi National Park ecosystems give a good overview of the common ecosystems in the region. Thus it has been an optimal solution to select the Tolvajärvi and Koitajoki areas to the national park. Two types of mid-taiga landscape covering about a half of southern Karelia contact in the park. There also are important nature objects and outstanding areas for recreation in the park (Tolvajärvi esker - lake system and the flood lands of River Koitajoki).

Practically all mid-taiga features of the Baltic Shield taiga zone from the Leningrad Region to the Murmansk Region can be found in the park. In the mid-taiga sub zone of Karelia there are no other protected areas with similar features.

3.8. Flora

3.8.1. Vascular plants

According to the floristic and zoological zoning, the park area is referred to as the Suojärvi Floristic Region (*Ramenskaya, 1983*) for flora and the Inner Karelia Zoogeographical Region for fauna. These regions are characterised by very poor flora and fauna.

There are 324 species of vascular plants in the Koitajoki area, of which 284 are aboriginal (native), 40 introduced and wild (there are no species in need of protection among them because they are common in this area) (*Kravchenko, Kryshen, Gnatiuk, Butskikh, 1997**).

Boreal species prevail in the flora (214-75,4%). There are 27 (9,4%) cosmopolite species and 26 (9,2%) species with northern associations. The most common of them are mountain crowberry (*Empetrum hermaphroditum*) and crowberry (*Empetrum nigrum*). Only 17 species (6%) like lily-of-the-valley (*Convallaria majalis*) and feather reedgrass (*Calamagrostis arundinaceae*) are southern. Pure brown grass (*Melica nutans*), lesser butterfly orchid (*Platantera bifolia*), *Equisetum hiemale*,

spurge laurel [February daphne] (*Daphne mezereum*), broad-leaved willow-herb (*Epilobium montanum*), etc. are examples of rare species of the park. Eastern species are represented by prickly rose (*Rosa acicularis*), Arctic bramble (*Rubus arcticus*), pygmy water-lily (*Nymphaea tetragona*), fringed pink (*Dianthus superbus*), etc. Western species as quillwort (*Isoetes lacustris*), *I. echinospora* and water lobelia (*Lobelia dortmanna*) are also listed in the Red Data Book (*Red Data Book., 1998*).

The Tolvajärvi area is also within the Suojärvi Floristic Region (Ramenskaya, 1983). Only 372 species of vascular plants from over 1 400 of those growing in Karelia have been found. At present there are 345 wild and intraspecific hybrids, including 303 (85,6%) aboriginal (natural) species and 51 (14,4%) introduced and wild species.

The prevailing species (226 species or 74%) in the area are aboriginal, common boreal species with wide distribution pattern. There are practically no species with southern links or they are rather rare as black alder (*Alnus glutinosa*), spurge laurel (*Daphne mezereum*) and common dog-violet (*Viola riviniana*). Lily-of-the-valley (*Convallaria maialis*), a boreal-nemoral species, and feather reedgrass (*Calamagrostis arundinacea*), a south-taiga species are, however, common and abundant. Altogether, 24 species (7,9%) with southern links have been recorded. There are a few boreal species like *Salix acetosella*, which need fertile soil.

The local flora is dominated by Euro-Asian species (115, 37,9%) and circumpolar species (106 – 35%). The number of European (45 – 14,8%), Euro-Siberian (28 – 9,2%) and amfiatlantic (5 – 1,7%) species is much less.

From the protected species only those entered into the Red Book of Karelia (1995) and the RSFSR (1988) and the same as found in the Koitajoki area have been identified: quillwort (*Isoetes lacustris*), *I. echinospora* and water lobelia (*Lobelia dortmanna*) (*Red Data Book, 1998*) (fig. 9). All three species are widely spread in the western part of South and Central Karelia. For research tourism, the most interesting floristic sights could be the valley of the River Tolvajoki, Haukivaara area, and abandoned farms and settlements.

Summing up, the flora of both the Koitajoki and Tolvajärvi areas is rather homogeneous and carries a distinct taiga image with the dominance of oligotrophic habitats.

The poor flora is one of the most important indices of the natural state of the ecosystems, proof of succession under low-pressure extensive management during the whole history of man's presence in the area. In this regard, the proposed national park is a sample of natural state taiga ecosystem in and in need of protection.

3.8.2. Mosses

The only finding of *Sphagnum molle* in Russia is from the Koitajoki – Tolvajärvi National Park. *Sphagnum molle* was also listed in the Red Data Book of the USSR (1984). The total number of mosses recorded in the park is 132 species, which is 30 % of bryoflora in Karelia (*Volkova, Maksimov, 1993; Kuznetsov, Maksimov, 1995*).

Most of the mosses in mires are *Sphagnum* species. Raised bogs are dominated by *Sphagnum angustifolium*, *S. fuscum*, *S. magellanicum*, *S. majus*, *S. balticum*. Phytocenoses with *S. lindbergii*, *S. capillifolium*, *S. russowii* are more rare. Mesotrophic bogs are prevailed by *Sphagnum fallax*, *S. angustifolium*, *S. riparium*, *S. papillosum*, while *S. obtusum* and *S. centrale* are not common. In the floodlands one can find *S. fallax*, *fimbriatum*, *S. subsecundum*, *Warnstorfia exannulatus*, *W. fluitans* and *Calliergon cordifolium*. *Sphagnum platyphyllum* and *S. inundatum* are very rare.

The bryoflora of old spruce and pine forests consists of both typical taiga species and rare species. *Pleurozium scheberi*, *Hylocomium splendens*, *Dicranum polysetum*, *D. scoparium*, *D. majus*, *Ptilidium crista-castrensis* are common species. *Sphagnum girgensohnii*, *S. russowii*, *S. capillifolium*, *S. squarrosus* grow in microdepressions. *Sphagnum quiquefarium* and *Hylocomiastrum umbratum* are rarely met indicator species of old-growth forests.

Calypogeia suecica is an indicator species of decayed wood, *Schistostega pennata* can be found on open soil under fallen trees. The bases of spruce trunks are covered by *Plagiothecium laetum* and *Ptilidium pulcherrimum*. *Dicranum fuscescens*, *Plagiothecium laetum*, *Brachythecium starkei* and *Ptilidium pulcherrimum* grow on birch trunks. *Plagiomnium cuspidatum*, *Brachythecium starkei*. *Rhytidiadelphus triquetrus* and *Plagiomnium cuspidatum* are met on aspen trunks. An epiphyte *Radula complanata* is rarely met on aspen trunks.

The main mosses met in meadows are *Rhytidiadelphus squarrosus*, *Brachythecium reflexum*, *Racomitrium canescens*, *Aulacomnium palustre*, *Dicranum scoparium*, and *Polytrichum commune*.

The common species found on large boulders with low mineralisation rate are *Andreaea rupestris*, *Racomitrium microcarpon*, *Pleurozium schreberi*, *Paraleucobryum longifolium*, *Dicranum scoparium*, *Brachythecium starkei*, *Ptilidium pulcherrimum*, and *Anastrophyllum minutum*.

The most abundant water bryophytes are *Fontinalis dalecarlica* and *Dichelyma falcatum*. Sometimes, one can see *Hygrohypnum ochraceum*, *Racomitrium aciculare*, and *Schistidium agasizii*.

The unique features in the bryoflora of Koitajoki – Tolvajärvi National Park are (1) a number of Atlantic species, and (2) *Sphagnum molle*, the "Red Data Book" species enlisted in the Red Data Book of the USSR (1984), Red Data Book of Karelia (1995) and Red Data Book...(1998) (*Maksimov* 1995).

3.9. Fauna

3.9.1. Mammals

The fauna of the Koitajoki-Tolvajärvi area consists of 42 species of mammals. Insectivorous species and rodents make the greatest share, i.e. 23 species, predators are represented by 13 species according to **Belkin** and **Kanshiev** (1997). The most common micromammalia species are the Eurasian shrew (*Sorex araneus* L) and bank vole (*Clethrionomys glareolus* Schr.), white field vole (*Microtus agrestis* L) and Eurasian harvest mouse (*Micromys minutus* Pall) are quite rare (table 4).

Table 4

Mammals of Koitajoki – Tolvajärvi National Park according to **Belkin** and **Kanshiev** (1997).

Species		Abundance
<i>Talpa europaea</i>	Mole	Very rare
<i>Sorex araneus</i>	Eurasian shrew	Common
<i>Sorex caecutiens</i>	Laxmann's shrew	Rare
<i>Sorex minutus</i>	Pygmy shrew	Common
<i>Sorex minutissimus</i>	Miniscule shrew	Very rare
<i>Sorex isodon</i>	Even-toothed shrew	Rare
<i>Neomys fodiens</i>	Water shrew	Rare
<i>Vespertilio nilsoni</i>	Northern bat	Common
<i>Plecotus auritus</i>	Brown big-eared bat	Abundance not known
<i>Lepus timidus</i>	Hare	Common
<i>Sciurus vulgaris</i>	Squirrel	Common
<i>Pteromys volans</i>	Flying squirrel	Rare
<i>Castor canadensis</i>	American beaver	Common
<i>Sicista betulina</i>	Northern birch mouse	Very rare
<i>Rattus norvegicus</i>	Brown rat	Common near settlements
<i>Mus musculus</i>	House mouse	Common near settlements
<i>Micromys minutus</i>	Harvest mouse	Rare
<i>Myopus schisticolor</i>	Wood lemming	Common
<i>Clethrionomys glareolus</i>	Bank vole	Common
<i>Clethrionomys rutilus</i>	Northern red-backed vole	Very rare
<i>Clethrionomys rufocanus</i>	Gray red-backed vole	Very rare
<i>Microtus arvalis</i>	Common vole	Abundance not known
<i>Microtus agrestis</i>	Field vole	Rare
<i>Microtus oeconomus</i>	Tundra vole	Rare
<i>Arvicola terrestris</i>	Water vole	Common
<i>Ondatra zibethica</i>	Muskrat	Common
<i>Canis lupus</i>	Wolf	Common
<i>Vulpes vulpes</i>	Fox	Common
<i>Nyctereutes procyonoides</i>	Raccoon dog	Single
<i>Ursus arctos</i>	Brown bear	Common
<i>Mustela erminea</i>	Ermine	Common
<i>Mustela nivalis</i>	Least weasel	Common
<i>Mustela putorius</i>	European polecat	Very rare
<i>Mustela vison</i>	American mink	Common
<i>Martes martes</i>	Pine marten	Common
<i>Gulo gulo</i>	Wolverine	Common
<i>Meles meles</i>	Badger	Rare
<i>Lutra lutra</i>	Otter	Common
<i>Lynx lynx</i>	Lynx	Rare
<i>Sus scrofa</i>	Wild boar	Abundance not known
<i>Alces alces</i>	Elk	Common
<i>Rangifer tarandus fennicus</i>	Forest reindeer	Rare

The game animal fauna of the Koitajoki-Tolvajärvi National Park is roughly similar to the adjacent areas of the Suojärvi District. However, some differences have been found in their distribution and population, particularly according to the latest winter surveys made in 1997 (Table 5).

Table 5

Number of game animals (in winter 1997) of the proposed Koitajoki-Tolvajärvi National Park compared with the rest of the Suojärvi District (traces per 10 km line)

Species		Traces per 10 km line on snow	
		Koitajoki-Tolvajärvi National Park	Suojärvi District
<i>Sciurus vulgaris</i>	Squirrel	4,8	6,55
<i>Canis lupus</i>	Wolf	0,2	0,34
<i>Mustela erminea</i>	Ermine	0,8	0,70
<i>Lepus timidus</i>	Hare	4,4	10,53
<i>Sus scrofa</i>	Wild boar	0	0,06
<i>Martes martes</i>	Pine marten	2,0	1,90
<i>Vulpes vulpes</i>	Fox	0,8	0,97
<i>Alces alces</i>	Elk	3,0	1,51
<i>Rangifer tarandus fennicus</i>	Forest reindeer	0	0
<i>Gulo gulo</i>	Wolverine	0	0
<i>Lynx lynx</i>	Lynx	0,6	0,15
<i>Mustela putorius</i>	Polecat	0	0,22

Squirrel, hare, brown bear, pine marten, fox, lynx, wolf and elk are mid-taiga species typical to the national park. Also some mammals of Nordic origin, e.g. wolverine, are occasionally met. Southern taiga species as badger, polecat and wild boar can be met as well. The number of elk is higher in the park than in neighbouring areas because the animals migrate to the area at the end of winter. A high density of elk is observed in the adjacent Finnish area.

3.9.2. Birds

According to a preliminary survey in the Koitajoki River valley, 122 species of birds have been found. The nesting fauna consists of 104 species and 9 species are considered occasional. The most common species are, e.g., Wigeon, Goldeneye, Capercaillie, Hazel Grouse, Grey Crane, Ural Owl, Tengmalm's Owl, Black Woodpecker, Three-toed Woodpecker, Willow Tit, Rustic Bunting and Cross-bill. The River Koitajoki area is one of the three most important reproduction sites of Whooper Swan and Bean Goose in southern Karelia. The region is an important resting place during migrations for *Anatidae* and *Charadriidae*. A low-density rate has been registered for *Tetraonidae*.

Table 6

Population of *Tetraonidae* in the Koitajoki-Tolvajärvi National Park and adjacent areas of the Suojärvi District (density per 1 000 ha according to 1997 winter surveys)

Species	Tolvajärvi	Koitajoki	Suojärvi District (average)
Capercaillie	2,84	3,25	5,61
Black grouse	16,41	3,85	24,60
Hazel grouse	12,43	14,20	20,72
Willow grouse	1,37	6,66	10,78

Bird diversity and number of individuals are low in the Tolvajärvi area of the National Park. The number of species is, however, higher than in Koitajoki area. The low diversity and low number of individuals are typical of this part of taiga and is connected with the landscape characteristics: dry pine forests are of relatively low productivity, waterlogged areas are unevenly distributed and the dominating oligotrophic waters are not favourable for waterfowl. Human activities have also been in a minor role in the area lately: agricultural landscape is in small and degrading fragments and there are only a few forest cuttings at the early successional stage. According to the field research and available literature, 174 species of birds can be met in the Tolvajärvi area (Zimin et al., 1993; Volkov et al.,

1990; Backman, 1886; Hyytia, 1983; Koskimies, 1979; Merikallio, 1946, 1958; Schulman, 1882; Soveri, 1942, Zimin et al., 1995,a,6).

Inventory results have registered 146 species in the Tolvajärvi Nature Reserve, of which 112 are nesting birds, and 17 more species used to nest or belong to occasionally nesting.

Original taiga ornithofauna is largely inhabiting the area. Taiga, hypoarctic and arctic species make up 33,9% (38 species) of the nesting birds. The proportion of European broad-leaved forest species is 28,6% (32 species). The density of the nesting pairs in common Tolvajärvi habitats – mature pine forests of ridge (esker) area – is 130,2 pairs per km², which is low for the Karelian middle-taiga. This figure is found low for the middle taiga sub zone of Karelia, where the average density fluctuates from 150 to 250 pairs per km² (Volkov et al., 1990).

Tolvajärvi is an important resting area for migrating waterfowl and aquatic birds (e.g., *Clangula hyemalis* (long-tailed duck), *Branta bernicla* (brent goose), *Br. Leucopsis* (barnacle goose), *Cygnus bewickii* (Bewick's swan)). Also, there are nine biotopes crucial for the reproduction of both common and endangered birds.

There are 20 rare and endangered bird species breeding in the Koitajoki-Tolvajärvi Park, and 18 of them are enlisted in the Red Data Books of Karelia, Russia, Finland and East Fennoscandia (fig. 9):

- Russia's Red Data Book: *Aquila chrysaetos* (golden eagle) *Pandion haliaëtus* (osprey),
- Karelia's Red Data Book: *Gavia stellata* (red-throated diver), *Cygnus cygnus* (whooper swan), *Anser fabalis* (bean goose), *Falco columbarius* (peregrine), *F. tinnunculus* (kestrel), *Grus grus* (crane), *Larus fuscus* (lesser black-backed gull), *Bubo bubo* (eagle owl), *Phoenicurus phoenicurus* (redstart), *Lanius excubitor* (great grey shrike);
- Finland's Red Data Book: *Gavia arctica* (black-throated diver), *Falco subbuteo* (hobby), *Caprimulgus europaeus* (nightjar);
- East Fennoscandia's Red Data Book: *Philomachus pugnax* (reeve), *Lymnocyptes minimus* (jack snipe), *Emberiza hortulana* (ortolan bunting);
- Other rare and endangered species are *Limicola falcinellus* (broad-billed sandpiper) and *Parus cinctus* (Siberian tit), which no more nests here.

The ornithofauna in both of the protected core areas of the National Park is similar and species composition is common for taiga ecosystems dominated by oligotrophic habitats in natural state. Due to the differences in habitat composition and ecology in the core areas also the species composition of birds needing protection and entered in Red Data Books is different. This is caused by differences in landscape and ecological conditions of their habitats and considered an important indicator of the biodiversity of birds. In relation to this, the proposed National Park could be recognised as a sample of the European taiga in need of protection.

3.9.3. Fish

The Koitajoki-Tolvajärvi National Park possesses significant fish resources for amateur and sports fishing. Studies conducted in summer 2000 have still extended knowledge about the fish fauna (Table 7).

Table 7

Dominant fish species in some lakes and rivers in Koitajoki – Tolvajärvi National Park according to the studies done in the summer 2000 (Ilmast and Pavlov 2000)

Lakes and rivers	Fish species
Kullajärvi	Ide, pike, perch, dace
Luovenjärvi	Ide, pike, perch
Kangasjärvi	Perch
Konpushki	Pike, perch
River Sikapuro	Whitefish, pike, perch
Kivijärvi	Whitefish, pike, perch
Ala-Vieksjärvi	Pike, perch, whitefish (rare)
Ylä-Vieksjärvi (buffer zone)	Whitefish, vendace, pike, perch
Pastojärvi (buffer zone)	Whitefish, vendace, pike, perch

Lakes in the northern part of the Park, in the Koitajoki area are common "perch-roach-pike reservoirs". Large ides (over 3 kg) and pike (over 10 kg) attach special attraction and value to the lakes in this area.

Table 8

Fish species caught in the Koitajoki-Tolvajärvi National Park

1. <i>Coregonus albula</i>	Vendace
2. <i>Esox lucius</i>	Northern pike
3. <i>Abramis brama</i>	Bream
4. <i>Alburnus alburnus</i>	Bleak
5. <i>Leuciscus idus</i>	Ide
6. <i>Leuciscus leuciscus</i>	Dace
7. <i>Rutilus rutilus</i>	Roach
8. <i>Lota lota</i>	Burbot
9. <i>Gymnocephalus cernuus</i>	Eurasian ruff
10. <i>Perca fluviatilis</i>	Eurasian perch
11. <i>Cottus gobio</i>	Bullhead

The fish fauna in the Tolvajärvi lake cluster (Tolvajärvi, Juurikkajärvi, Saarijärvi, Ylä-Tolvajärvi, Ala-Tolvajärvi) consists of 11 species (Table 8). The most abundant species are perch, roach, and vendace, pike and dace are more rare. Half of the fishes (perch, ruff, roach, pike, ide, and dace) belong to plain boreal bodies of water, vendace and burbot (20 % of the fish species) belong to the Arctic freshwater complex and bream & bleak to the Pontic freshwater complex. One species, bullhead, belongs to the boreal by-mountain complex and it is also recorded in the Red Data Book of Russia. The special asset of these lakes is the large-size form of vendace. The population of the vendace from the Tolvajärvi cluster of lakes could be used for the introduction of this species. Thereby, Tolvajärvi lakes are considerably interesting scientifically and call for special measures to protect the local population of vendace.

3.9.4. Insects

Most information concerning the Koitajoki - Tolvajärvi area has been obtained from studies conducted in the North Karelia Biosphere Reserve in Finland. The Biosphere Reserve borders the national park in Koitajoki area (**Yakovlev, Humala, Polevoi, 1997***). The studies have concentrated mainly on three insect orders: beetles (*Coleoptera*), two-winged flies (*Diptera*), and wasps (*Hymenoptera*) connected with dead wood and fungi. From *Coleoptera* 294 species have been found and these belong to 55 families. Scolytidae is the most rich family with 28 species, *Nitidulidae* reaches up to 27, *Cerambycidae* to 18, *Elateridae* to 18, *Leiodidae* to 16, *Latridiidae* to 15, *Curculionidae* to 15, *Anobiidae* to 12, and *Cisidae* to 12 species (**Yakovlev et al., 2000, in press**).

From the order true flies (*Diptera*), 502 species have been registered, including species enlisted in the Red Data Books of Karelia and Finland. The dominant species of Diptera belong to sub-family *Sciarioidea* (**Polevoi, 2000, in press**). Hymenoptera are represented by 264 species, most of which, as *Aniseres caudatus*, have been found first in this area (**Humala, 2000, in press**).

Several of the insects are classified endangered in the Scandinavian countries and are met in Karelia in old-growth stands. Finland's Red Data Book (**Rassi et al., 1991**) and Fennoscandia's Red Data Book (**Red Data Book, 1998**) include 13 of the *Coleoptera*, 4 of the *Diptera* (*Pachyneura fasciata* Zetterstedt, *Keroplatus tipuloides* Bosc, *Xylophagus ater* Mg, *Xylophagus junki* Szilady) and 2 of the *Hymenoptera* species. One of the beetle species - *Cyllodes ater* Herbst (Nitidulidae) was thought to have been extinct since 1918.

Studies of the xylophilous entomofauna are proceeding also in the Tolvajärvi area. So far several rare and endangered species of from the orders Coleoptera, Diptera and Hymenoptera have been found. *Peltis grossa* (Trogositidae), *Triplax rufipes* (Erolytidae), *Mycetophagus quadripustulatus* (Mycetofagiidae) and *Tomoxia bucephala* (Mordellidae) are Coleoptera, *Pachyneura fasciata* Zetterstedt, *Keroplatus tipuloides* (Bosc), *Xylophagus ater* Mg. and *Xylophagus junki* (Szilady) are Diptera and *Spudaeus scaber* Grav. and *Odontocolon spinipes* Grav. (Icheumonidae) are Hymenoptera species included in the Red Data Books of Karelia (1995) and Finland (1998).

Finnish entomologists (*Siitonen et al., 1995*) have recorded a high number of Coleoptera species vulnerable to human transformation in the forest along the Korpiselka-Tolvajärvi road. The number of these species is higher in Karelia than in adjacent areas in Finland due to the greater amount of dead wood at various stages of decay in Karelian forests.

Pine forests subjected to resin extraction are in poor condition. In some areas more than half of the trees have fallen down by breaking at tapped wounds (2-3 m above the earth). These trees have de-

cayed from the tapping wounds due to heart rot and fallen down during windstorms (**Yakovlev et al.**, unpublished).

One may assume the exuberance of rare and endangered species on Finnish side is partly accounted for by the neighbourhood with unmanaged Karelian forests. There are also – already after the very preliminary studies in Tolvajärvi – indications of remarkably rich entomofauna in Koitajoki – Tolvajärvi national park. This argues the proposed National Park to be of high environmental value.

3.10. Wood-destroying fungi

Aphylophoroid fungi (Aphylophorales) in the pine forest of the Tolvajärvi area

Wood-destroying fungi are important in ecosystem maintenance and important indicators of ecosystem state and changes. This list of 70 species of aphylophoroid fungi was prepared after a two-days visit to Tolvajärvi Landscape Reserve in June, 20-21, 2000 (Bondartseva M.A., Lositskaya V.M.**). The list reflects the availability of fruit bodies of aphylophoroid fungi characteristic for the beginning of the vegetation season, and is insufficient for definite conclusions.

Some old growth forest indicator species (Kotiranta and Niemela 1996) *Crustoderma dryinum* (Berk. et M.A. Curtis) Parmasto, *Phellinus chrysoloma* (Fr.) Donk, *Ph. ferrugineofuscus* (P. Karst.) Bourdot, *Ph. lundelii* Niemelä were found of rotting wood. *Inonotus obliquus* (Pers.: Fr.) Pilát, *Ph. chrysoloma* (Fr.) Donk, *Ph. ignarius* (L.: Fr.) Quél., *Ph. tremulae* (Bondartsev) Bondartsev et Borisov were growing on living trees.

Over 50 % of the species are corticioid fungi. Of poriid fungi only species having perennial or wintering fruit bodies were found. A high number (15, of which 11 species belong to genus *Phellinus*) of hymenochaetoid fungi confirms the seasonal character of the aphylophoroid biota.

3.11. Phytoplankton

All waters are typical to Russian Karelia and Finland, and they are characterised by rather poor but typical diversity and composition of fish species and biocenoses in general.

Periphyton algae of River Koitajoki and its tributaries consists of 50 species from taxons *Cyanophyta* (5 species - 10.0%), *Bacillariophyta* (30 species - 60.0%), *Chlorophyta* (12 species - 24.0%) and *Rhodophyta* (3 species - 6.0%).

The floristic composition of the periphyton in the explored rivers is quite uniform. The dominance of widely spread and acidophilic species is conspicuous due to an influx of acidic, low-productive water from paludified reservoirs. This strengthens the uniformity of the algae flora and restrains the spread of many species. The algae flora lacks species with high requirements of phosphorus and nitrogen. In most explored areas algae flora is characterised by species such as *Tabellaria flocculosa* (Roth.) Kütz. + *Eunotia* spp., + *Frustulia rhomboides* (Ehr.) D. T. The biomass of the groups is, as a rule, defined by *Batrachospermum moniliforme* Roth. – a species common for highly-humified waters of Fennoscandia.

The majority of existing algae groups are widespread in fresh waters in the region. Cosmopolitan forms are common and there are no endemic features in the composition and density of phyto- and zooplankton. The situation is similar with macrozoobenthos and aquatic vegetation. However, the typical biota also indicates ecological purity of water ecosystems of Tolvajärvi.

3.12. Non-wood resources

Medical herb resources have been estimated to about 3 350 tons. The most widespread items are Blueberry leaves, Bilberry and *Ledum palustre*. Despite rich resources, herb collection is not recommended within the national park. However, berry resources can be utilised. Traditional and very popular berries in the area are Bilberry, Blueberry, Cranberry and Cloudberry. The Bilberry yield is in general about 80 – 150 kg/ha and in the cutting areas it is up to 250 kg/ha. Blueberry yield in pine and spruce forests with the wood-stand density at 0,6 and lower is more stable, although differs from 100 – 150 kg/ha by year. Cranberry and Cloudberry yields are less stable: yearly Cranberry harvest varies from 5 to 300 kg/ha and the average Cloudberry yield is only 25 kg/ha. A good Cloudberry crop can be obtained in 4-6 years intervals only.

** The double asterisk refers to unpublished data obtained in 2000.

3.13. Recreational assessment of the National Park

Tolvajärvi was protected as a so called Crown Park during 1919-1939 when the territory was a part of Finland. The park area was, at that time, only 12 ha. The first proposal on establishing a Russian national park was done by the Ministry of Environmental Protection in Karelia in 1993. Since 1995, the southern part of the proposed park, the Tolvajärvi area, has the status of a partial nature reserve for landscape protection (landscape zakashnik). Its covers an area of 41 900 ha.

The recreational values of the proposed park territory can briefly be presented as follows:

- Typical western taiga forests, a mosaic of bright pine forests, eskers and lakes in the Tolvajärvi area, and old-growth forests, rivers and mires around Koitajoki.
- Fine esker formations with steep slopes and esker-pits, beautiful lake views on 160 lakes.
- Some rare plants and fauna typical for taiga-wilderness. Tolvajärvi is the southernmost part of the living range of the forest reindeer.
- Ancient settlements from the stone age in Kuolismaa, old fields of the former Karelian settlements and their folklore.
- Winter War and the Second World War memorials. The Koitajoki area is situated in the border zone where no access is allowed without a special permission from the Frontier Guard. Since the end of 1990s, some tourism has been revived in the Tolvajärvi area again. Finnish people want to see their old home sites and the Winter War battle fields. Local people from the nearest villages visit the area for fishing and picking berries and mushrooms. There have been small forest fires in some areas. A total of 16 wild cottages are raised along the shores.

The new proposed border stations, Haapovaara and Ruhovaara, are located in the territories of Koitajoki–Tolvajärvi. Restricted traffic, mainly for timber transfers, exists but also some visitor groups have crossed the border with special licenses. It is assumed that Haapovaara Border station will get the international status in 10 years and Ruhovaara in 15 years, but it is no way certain. Traffic via Haapovaara would increase rapidly because it is the shortest way to Petrozavodsk from East and North Finland. Both Koitajoki and Tolvajärvi parks will be located just along this road. Ruhovaara would be interesting for tourism traffic because many Finnish companies can organise nature and extreme nature tours to the Tolvajärvi area.

The Tacis Project IMSEDIGIS TSP/RK/9803/094 in Tolvajärvi, funded by the Tacis Cross-Border Cooperation Small Project Facility, was carried out in 1998-2000. During the project, plans were established for e.g., trails, fire places with shelters, improved roads, brochures, etc. Therefore, there is already infrastructure available.

Formerly, the territory of the proposed national park was inhabited by orthodox Karelian people. Many famous bard singers, e.g. Vornanen and Shemeikka families, lived here. A memorial for Karelian bard singers was raised in 1929. In 1939, a hotel was constructed on an esker between Tolvajärvi and Hirvasjärvi lakes. In the 1920-1930s, the area was developing fast as a tourist resort because of its beautiful lake-esker landscapes. However, this development ended when the war broke out in 1939.

During the Winter War, heavy battles were taking place. The villages were evacuated and burned, the hotel was destroyed, the memorial disappeared and, finally, the territory was moved to the Soviet Union regime. A small Russian village was inhabited by Tolvajärvi lake until 1978 when people moved to larger villages.

In 1999-2000, some roads from Värtsilä and Raikonkoski to Tolvajärvi were improved in order to facilitate tourism. Campsites, fireplaces with open shelters and info boards were set up. Broken bridges and poor condition of roads are still impeding the use of the territory. The Tolvajärvi partial nature reserve is managed by the "Municipal Enterprise of the Tolvajärvi", owned by the Suojärvi District.

Twenty kilometres south of the partial nature reserve, accommodation is available in a house administrated by the Municipal Enterprise. Its capacity is 15 beds. Tour agencies "Kolmas Plus" in Sortavala and "Ilomantsi Tourist Service" are receiving groups, mainly for fishing and history tours. In 2001, a cabin and a house, each with accommodation capacity of ten person and a sauna, were moved to the former village of Tolvajärvi and will be used for tourism by the Municipal Enterprise.

Tolvajärvi area is today popular among local fishermen, especially during the spawning season of vendace in autumn. So far, fishing licenses have not been sold for foreigners. Hunting is only allowed outside the proposed park borders. Elk, bear and small game are popular. Foreign visitors, about 50-80 persons per year, prefer bear hunting. They have annually had 10 bear licenses. Every summer, an ecological camp for 20-30 children is organised by the Suojärvi House of Arts and Repub-

lican School of Tourism, and some small groups of native people and war veterans are visiting Tolvajärvi.

4. History and cultural heritage of the National Park

The history of the region is rich and interesting. Habitation of the area seems to have started about 9000 years ago in the Mesolyte Age, i.e. soon after the Ice Age. Signs have been found also about material culture of Neolithic Age (7000-5000 years ago, characterised by earthenware (clay)) and Early Metal (Bronze and Iron) Age (5000-2500 years ago). The development of modern Baltic-Finnish ethnography dates back to the Middle Ages 1 000 – 500 years ago (**Vikkula, 1990**).

The first known boundary between Sweden and Novgorod was established according to the Orehovetski peace treaty in 1323, when Novgorod voluntarily handed over to Sweden three western *pogosts* (administrative units) and Sweden agreed with Novgorod to annex the Karelian Isthmus. But areas of the Koitajoki River basin belonged to Novgorod already at that time upon the agreement concluded after the 25-year-war by the Tavzinsky Treaty. At the end of the 15th century the Russian and Karelo-Novgorodian lands were united into the Russian centralised State. The area in question was entered officially into the Bodskaja Pyatina (district) and also into the boundaries of the Ilomansky pogost Pogost in the Korela Ujezd (administrative unit). After the Swedish aggression at the end of the 16th century (1595) about 3 thousand farms (communities) dilapidated in four largest pogosts: Kirjazhsky (Kurkijoki), Serdobolsky (Sortavala), Ilomansky pogost (Ilomantsi) and Solomensky (Salmi). Only 322 farms survived. Some of the population died, other people moved to Russia (**Stories of the Karelian History, 1957**). In 1617, the Ilomansky pogost was handed over to Sweden. Further historical facts were not less dramatic till 1661 in connection with religious and other reprisals of the new administration towards the local Karelian population. Since practically only Swedish laws were in force and Karels were converted to the Lutheran Church by force, thousands of families migrated to Russia (**Saloheimo, 1976, 1980; Kochkurkina, 1982; History of Karelia in documents, 2987, 1991; Jutikkala, 1995**).

Only in the middle of the 18th century, after the Northern War, relative public order was settled and it lasted until the beginning of World War II, when the Moscow peace treaty of March 14, 1940 was concluded and which resulted in a great loss for Finland of all Karelian land up to the boundaries fixed by Peter the Great. So, the eastern part of the Koitajoki River and a part of its basin are included in the Suojärvi District of Karelia in the Russian Federation.

A list of famous monuments of archaeology, history, culture and ethnography has been well prepared (fig. 10). An analysis of historical chronicles shows that settled people, although not in large numbers, populated these lands in the 14th century. Despite this circumstance, after that time brutal events would take place with the aim of gaining the territory. In particular, there are six mass graves of soldiers – the witnesses of wars during the last century.

Unlike the Koitajoki area, no archaeological studies have been done in this area, so no information is available about ancient monuments. The earliest records date back to 1590 registering the demolition of 4 churches in Tolvajärvi. According to this background we suppose that the population appeared in the area in the middle of the 16th century. Documents from the 17th century have information of taxpayers and an exclusively sparse, mainly Orthodox population.

The area is still famous in Finland for its rich folklore (rune) singing traditions. The area is a watershed and it has been considered to be historically isolated from transport connections, i.e., mainly waterways. The most active inhabitation started in the 1920s. In 1928 the population was 274 persons increasing to 414 by 1940 (Tema Nord 1999:522). Perhaps, it was much of a merit of the Tolvajärvi National Park, which was established in 1919. The development of the Park was interrupted in 1939, after the Winter War, when this area was annexed to the USSR.

In 1946 only 37 mainly Russians and Ukrainians lived in Tolvajärvi area. The population started growing in 1955, when forest harvesting was intensified. By 1966 the population reached 200 people. When forest resources were running short and the right of logging was transferred to the Ministry of Defence, the number of residents started declining. Finally, in the late 1980's and in the mid 1990's the rest of the population moved to other settlements after the devastation of the local settlement infrastructure (fig. 10).

5. Summary of the values

The value of the territory and the necessity of the establishment of the Koitajoki-Tolvajärvi National Park rest upon the following provisions:

- Koitajoki - Tolvajärvi region is located within the White-Sea - Baltic Watershed. Two dominant South Karelian middle-taiga landscapes common for East Fennoscandia meet in the area. In the western part of Middle Taiga, i.e., in the Suojärvi District, these landscape types have preserved well. The area is optimal for protecting and exhibiting these landscape types
- Tolvajärvi lake system surrounded by eskers, and Koitajoki river flood lands represent the two landscapes covering about a half of the southern Karelia. They are valuable for nature and recreational values. Almost all middle taiga features of the Eastern Fennoscandia from Karelian Isthmus to the Scandinavian Peninsula and Murmansk region are available in the area. Nature with similar characteristics has not been protected anywhere in the middle taiga sub zone of Karelia.
- Vascular plant flora bears a distinct middle-taiga image with slight features of both southern and northern flora. The flora is very poor and typical to taiga zone dominated by oligotrophic habitats. The number of vascular plants is 324 for the Koitajoki and 372 for the Tolvajärvi area, of over 1400 species known in Karelia. Flora protection value of the areas is low. However, there are 132 species of mosses (30% of the Karelian bryophyta) and the protection of mires will save *Sphagnum molle*, a red listed moss endangered in Fennoscandia.
- Mammal fauna of the national park consists of 42 typical taiga species, 12 of which are game species. Koitajoki area might be important in conservation of forest reindeer on the southern margin of its distribution in Fennoscandia.
- The breeding bird fauna includes 122 species in Koitajoki and 146 species in the Tolvajärvi area. The total number of bird species encountered in the national park is 174. The Red Data Books of Russia, Karelia, and East Fennoscandia have enlisted 18 species found from the park. The total number of rare and endangered bird species from the park is 20. Also a relatively high density of game birds, e.g., capercaillies and waterfowl has been registered.
- The flora and fauna of both core areas are similar to each other and common for taiga ecosystems dominated by oligotrophic habitats. In relation to this, the proposed National Park could be recognised as a sample of the European typical taiga in need of protection.
- The population of the large growing vendace from the Tolvajärvi cluster of lakes could be used for the introduction of this species. The species is interesting from a scientific point of view and calls for special measures to protect the local population of vendace.
- A great number of rare and endangered insects have been recorded in the old-growth and resin tapped forests of the territory.
- There existed a protected area by lake Tolvajärvi from 1919 until 1939. The area was a part of Finland at the time. Tolvajärvi area is famous for its rune-singing traditions and monuments of history, including numerous pieces of evidence about battles taking place during World War II.
- In Koitajoki-Tolvajärvi National Park, there are 13 geological and 16 geo-morphological monuments of nature and 9 zoologically valuable biotopes. These biotopes are crucial reproduction sites for both common and endangered birds. Kalatonsuo mire is a noteworthy peatland area.
- Tolvajärvi with surroundings has a high recreational value. The pine forests are mainly easy to hike, lakes and rivers make up an attracting network for visitors interesting canoeing, moving by rowing boat and fishing.
- Tolvajärvi-Koitajoki NP will be a part of the core-zone of the International Biosphere Reserve. Preparations for the establishment of the BR is in process in the Russian – Finnish co-operation between the states in the field of nature conservation.

6. Threats if the National Park is not established

At the moment, there is no forestry in the Tolvajärvi Partial Nature Reserve due to its position as a Partial Nature Reserve. Unfortunately there is no regulation approved for the use of the territory. The Koitajoki area has temporary protection in the form of the resolution of the Karelian Government. It will cease by the end of 2001, if not continued. Thus, there is a risk of new commercial cuttings in the Koitajoki area, and also the future of the Tolvajärvi area is unclear.

The Tolvajärvi territory is already in recreational use. Unfortunately, there can be seen the disadvantages of wild tourism. Small forest fires have burned forest, trees are felled for firewood and construction, sixteen illegal cottages - mainly in the most beautiful places – deteriorate the landscape and clutter along the shores is very common. Hunting is supposed to be forbidden within the partial

nature reserve, fishing is allowed, but both activities commonly take place here without licenses. This uncontrolled tourism is very difficult to stop as long as there is no national park. The Municipal Enterprise Tolvajärvi has no authorisation in this respect. Other authorities have control over land, forests, water as well as fishing and hunting. The employees of the enterprise cannot directly intervene in the abuses.

There is evidence of similar problems in the Koitajoki area, even within the border zone, where the frontier guard has full control.

This kind of wild tourism is fairly new here, because until the beginning of 1990s the territory belonged to a border area, where access of non-military persons was strictly controlled. If no improvement can take place, the current wild life together with some forestry activities will destroy the special values of the area.

7. Assessment of impacts of the establishment of the Koitajoki-Tolvajärvi National Park

7.1. Current socio-demographic situation in the Suojärvi District

POPULATION

The territory of the proposed Koitajoki National Park is located within the limits of the Suojärvi district, which is characterised by its specific demographic indicators, social, and production infrastructures (table 8).

The Suojärvi district was formed on July 9, 1940. After the war, people from different part of Russia moved here. There are a lot of people with Ukrainian and Belorussian background here. The population of the district was 25 454 persons in 1998 and they live in 25 settlements, the largest of them is the town of Suojärvi. Of the whole population 55% was of working age and 23% retired. The area of the district is 13 731 square km. The population density is 1,8 people per 1 square km.

Table 9

Socio-demographic structure of the Suojärvi population, 1998*

Name	Population, persons	Population structure		
		Under working age	Working age	Retired
Suojärvi district, Including	25454	5560	14083	5811
Suojärvi town		-	-	-
Porosozero (Porajärvi) village administration	4536	-	-	-
Porosozero (Porajärvi) village	4200	-	-	-
Gumarino village	321	-	-	-
Sovdozero village	14	-	-	-
Vegarus village administration	317	-	-	-
Vegarus administration	317	-	-	-
Naistenjärvi village administration	4087	-	-	-
Piitsijoki village administration	999	-	-	-
Loimola village administration	2183	-	-	-
Leppäsyvä village administration	971	-	-	-
Leppäniemi village administration	633	-	-	-
Veshkely village administration	720	-	-	-

* The table was done on the base of data from districts' local authorities

The closest settlements to the park are Vegarus, Loimola and Raikonkoski with the total population a bit over 2500 people (data on Raikonkoski is not available). They all are located no closer than 30 km to the Park.

There have been no significant changes in the demographic structure of Suojärvi during the last period. The number of active population made up 43% (11 000 people), the number of elderly - 23% the last position in the structure of the population is taken by youths - 22%. The demographic situation is characterised by a high decrease in the population rate. The mortality rate prevails over the birth rate 1,8 times. The natural decrease in 1998 was 151 people (the number of the deceased is 342, and the number of the born is 191).

EMPLOYMENT

The dominant industry in the district is forestry. It is also the biggest employer. The employment scheme of the District is prevailed by people working in non-production spheres, education, health care, housing and communal sector (table 10).

Table 10

Employment structure in the Suojärvi district in 1992 and 1997*

Branches of industry	Suojärvi district, % of employees	
	1992	1997
Forestry	-	39.3
Agriculture	-	3.3
Transport	-	12.9
Communications	-	2.2
Engineering construction and designing organisations	-	4.7
Trade, catering/food service, material provision	-	2.6
Housing and communal services and everyday services	-	5.7
Health care, sports and social welfare	-	7.6
Education	-	11.9
Culture and arts	-	2.6
Science	-	Data not available
Others	-	7.2

*The table was done according to data from material of the State Statistics Committee of the Republic of Karelia (1999)

According to data from the Department of Labour (Ms. Milyaeva, 1999), of the total employed population in the Suojärvi district 3,830 people are working for the industrial sector, in the non-production sector there are 3,460 people. In the administration of the district 71 and in that of villages 56 persons worked in 1998

Unemployment is regarded as one of the most acute social problems in the district. According to information from the Employment Department (Ms. Emeljanova, 1999), the dynamics of the unemployment rate in the Suojärvi district looks like this:

1992 - 1 % 1998 - 4,7 %
1996 - 5,1 % 1999 - 2,6 %

The peak of unemployment was registered in 1996. There were 1,004 unemployed people, and 70% of them were women. The overall reason for unemployment is either the shutdown or restructuring of enterprises. But in 1999 the unemployment rate reduced by half. It is connected with opening new or restructured enterprises. It is worth noting that 'hidden' unemployment is characteristic for the district (unemployed people not registered at the employment agency).

As of June 1, 1999 the employment agency reported 177 registered unemployed people. The number of unemployed is distributed over settlements as follows: Porosozero (Porajärvi) settlement - 110 people, Suojoki settlement - 2 people, Naistenjärvi settlement - 6 people, Toivola settlement - 3 people, Kostomuksa settlement - 3, Gumarino settlement - 8, Veshkelitsa settlement - 3, Loimola settlement - 4, Leppäniemi - 2, Suojärvi town - 43. One third of the unemployed are young people. In Suojärvi town, Porosozero settlement and Gumarino settlement there are working consultants at the employment agency.

7.2. Socio-economic situation in the Suojärvi District

The socio-economic situation depends upon the state of the economy and the development level of the main production enterprises. These enterprises are, in the first place, enterprises forming the main part of the local budget.

In the Suojärvi district the budget forming enterprises are forestry enterprises: "Zapkarelles" private company, "Porosozero" public-owned company, "Suojärvi Cardboard" public-owned company. The proportion of taxation deductions/payments from the forest industry in 1998 reached 46,4% of all taxes collected in the Suojärvi district. Second place was held by transportation enterprises. Their share was 30,5% (of them, 21,6% was collected from the railway).

Table 11

Amounts of logging done by timber enterprises of the Suojärvi district, thousands of cubic meters*

Enterprise	1997	1998
Zapkarelles	455.3	532.2
Lahkolampi Forestry Enterprise	74.1	67.5
Porosozero	24.6	46.0

* The table estimated from data of "Karellesprom" forestry complex.

Another crucial aspect is creating new jobs. The largest proportion of employed people in the Suojärvi district in 1998 were occupied in forestry - 32%, transport - 11,8%, trade - 8,4%, agriculture - 3% (table 10).

"Zapkarelles" company was established in 1940, it is the oldest enterprise in the district. Its production profile is timber felling and the delivery of round timber. Last time it was restructured was in 1973. Production growth of the enterprise started in 1994. The enterprise has 1,960 workers. The main structural divisions of the enterprise are 5 timber cutting units located quite distant from each other. On the base of these timber-cutting units forest settlements appeared - Piitsijoki, Loimola, Raikonkoski on the west, Vegarus in the north, Suojoki in the northwest. All settlements have shops, canteens, mini-bakeries organised by the forestry enterprise.

Table 12

Main enterprises of the production infrastructure of the Suojärvi district, I quarter, 1999*

Name	Branch	Number of workers	Ownership
Zapkarelles	Timber felling, wood processing	1960	Mixed
Lahkolampi Forestry	Timber felling	Data N/A	Mixed
Porosozero	Timber felling, wood processing	406	Private
Suojärvi Cardboard	Wood processing	350	Mixed
Suojärvi forestry unit	Timber felling	63	State
Suojärvi Bread	Baking Plant Food production	84	State
Suojärvi	Agriculture	216	Mixed
Veshkelitsa	Agriculture	90	Mixed
Suojärvi fowl-farm	Agriculture	65	Mixed
Suojärvi Auto Transportation	Transport	107	State
Suojärvi railway division of the October Railway	Transport	287	State
Suojärvi locomotive depot of the October Railway	Transport	699	State

*According to data from the local authorities

The social infrastructure is represented by practically all needed spheres (table 13).

Table 13

Social infrastructure of the Suojärvi district, 1999*

Sphere	Number of workers	Ownership
Communications	181	Mixed
Trade	230	State
Housing and communal services	568	State
Power production, energy	181	State
Health care	581	State
Education	1081	State
Social service centre for the elderly and disabled	102	State
Suojärvi district library system	112	State
Department of culture	92	State
Administration of the Suojärvi district	53	State
Social protection agency	18	State
Total through village administrations	54	State

* According to data from Suojärvi local authorities.

Small businesses reflect the extent of the economic activity of the local population. 51 private enterprises involving 355 people work in the sphere of small business. The dominant form of activity is trade and purchase activity.

The district has an undeveloped economic structure. Most people are directly or indirectly dependent on forestry. But only a small amount of forest products are manufactured here, export of round wood is prevailing. The local logging companies are often in difficulties, because Finnish companies can pay better prices of cutting permissions. For local people and the whole district, this development is problematic, because this kind of forestry brings no job opportunities or income in local budget. Unemployment degree is here very high, even if it cannot be seen from official statistics. The private sector is small and has, partially due to the low purchasing power of people, economical problems.

7.3 Expected social and economical impacts of the National Park

Withdrawal of natural resources entailed by establishment of the National Park will first of all concern timber harvesting. The existing estimated allowable cut in the Suojärvi forest enterprise (within the Suojärvi District) is 846 000 m³. As a result of establishment of the National Park, the theoretical annual allowable cut, a kind of roof for cuttings, will be reduced by 45 400 m³ in the Suojärvi district. If converted in marketable timber (output 75%) and with taking into account of the main sorts, annual losses will make up to:

Coniferous saw logs – 19 200 m³;
 Coniferous bolts – 12 800 m³;
 Deciduous saw logs – 3 600 m³;
 Deciduous bolts – 3 000 m³;
 Total – 38 600 m³.

Table 14
Financial losses

Sorts	Volume, thousand m ³	Sale price of 1 m ³ of timber in prices of 1998 (April), roubles	Losses, thousand roubles
Coniferous saw logs	19 200 m ³	231	4435,2
Coniferous bolts	12 800 m ³	134	1715,2
Deciduous saw logs	3 600 m ³	255	918,0
Deciduous bolts	3 000 m ³	169	507,0
Total	38 600 m ³		7575,4

Estimated losses of the timber-harvesting sector are assumptive because the needs in the forest fund of all main timber harvesters (Suojärvi lespromhoz, Lahkolampi lespromhoz, Porosozero lespromhoz, Suojärvi timber harvesting station) are satisfied fully at the expense of resources available beyond the borders of the proposed National Park and this situation will stay for at least 15-20 years. More than that, timber operations have not been conducted in this territory over the 1990s.

According to the Rosgiroles Institute, losses related to mining, forestry and agriculture, hunting and fishing, are imperceptible.

Forest management, harvesting and wood processing provides work to a significant number of people. Suojärvi is a district where forestry is the main employer and the backbone of economy. The big increase of round wood export has, however, reduced the work opportunities as Finns often also harvest and transport the wood they have bought using Finnish machinery and operators. The benefits from this export to the local people and economy are very limited. Under current conditions the one-sided orientation of large-scale industrial logging in cross-border Karelia provides only limited benefits to local socio-economy.

But if the territory of the proposed NP would be taken in full use as production forests of category III, it will lose its biological, recreational and cultural importance forever. There would also be less alternatives for developing the socio-economic situation and diversify the base of livelihoods in the Suojärvi district. In fact, the Park establishment is to be seen as an investment where about 5 % of the forest resources of the Suojärvi district are added to the protected areas network whereby Russia contributes her share to global conservation, and improves the acceptability of Russian wood based products in international markets. There remain enough forests in the region for sustainable management and increased processing locally.

While there is a worldwide, increasing demand for independently certified timber, the establishment of the Koitajoki-Tolvajärvi NP may favourably influence the image of the Republic of Karelia as one of the biggest timber-exporters to the European market. There will be fewer arguments in favour of limits on the purchase of timber from the Republic of Karelia. This is especially important in the present conflict between exporters and increased ecological requirements to forest products (actions of NGOs on constraining logging in the last European old-growth forest stands, boycott of Finnish companies on timber produced from territories, which they consider to be worthy of protection).

The increased activity will have significant impacts on the villages surrounding the Park. It will provide more employment both directly and indirectly. It is estimated that the requirement of new jobs in the park administration is 43 permanent persons within the five first years. Most of them will be dwellers of the nearest villages and Suojärvi town. Certainly some new families with high education will move from other areas and hopefully settle close to the park. It is quite predictable that the unemployment rate in rural areas will clearly decrease through direct employment in the park administration, management and supervision of the Park, and a growing number indirectly in tourism services. The establishment of the Koitajoki-Tolvajärvi National Park will cause more opportunities for entrepreneurs, when it gradually gets international recognition. Consequently, this will increase the number of self-employed people promoting the creation of jobs for themselves and their assistants. This will enhance interest from investors and positively impact the income level of the population in all sectors.

The NP will limit the rights of local people, but only in minor things. Hunting is already forbidden in the Tolvajärvi Partial Nature Reserve and will be prohibited also in the Koitajoki area. In that area, at the moment, practically nobody other than frontier guard staff and their guests are hunting. Fishing, picking of berries and mushrooms will not be limited. After the establishment of the NP, there will be not be anymore free access to the Strictly Protected zone, the area of which is 7 219 ha, it means 9,4 % of the NP. These restrictions are not going to have any practical importance for local people.

OPINIONS OF POPULATION

In 1999 some officers of the local administration and companies were interviewed as a part of a socio-economic study concerning their view on the establishment of the National Park (decrees of the Government of the Republic of Karelia #253 of 06.04.1995 and #938 of 04.11.1996 ordinance of the Head of the Local Administration on "Agreement of the borders of the Koitajoki National Park and its buffer zone" #124 of 25.03.1998).

In those discussions, and later in negotiations between the district administration and the Tacis Project Karelia Parks Development, a mainly positive attitude to the establishment was presented. Some kind of improvement to the fairly difficult socio-economic situation of the district is expected from tourism, which is believed to be refreshed because of the park. Some, but not all persons working in leading positions in forestry or forest companies, were worried about reduced cuttings in future. On the other hand, there seems to be only little information available and in common knowledge about the objectives, working methods and real consequences of a national park.

Evidently, the local administration was not pushing to support the establishment of the National Park. This became clear during the public meetings of the Tacis Project ENVRUS 9704 with the public population of the Suojärvi District (settlements of Pitsijoki and Porosozero).

7.4 Expected environmental impacts of the park establishment

The establishment of the Koitajoki-Tolvajärvi National Park will safeguard the existence of the territory as a refuge for taiga nature, which is about to be taken in commercial use everywhere around. The environmental state of the territory, particularly that of Tolvajärvi with surroundings, will improve through canalised tourism and effective supervision. Historical monuments are maintained and restored and old cultural landscapes can be managed.

II Proposal for the Plan of the Koitajoki-Tolvajärvi National Park

1. Objectives of the National Park

General objectives of Russian national parks are: 1) conservation of ecosystems, unique and primeval habitats and objects; 2) conservation of historical-cultural values; 3) ecological education of the people; 4) creation of favourable conditions for recreation and regulated tourism; 5) elaboration and introduction of scientific methods of nature protection and environmental education; 6) implementation of ecological education; 7) restoration of damaged nature and historical-cultural areas and objects.

For each national park separate objectives based on the peculiar circumstances shall be developed. The objectives for the Koitajoki-Tolvajärvi National Park are:

- ❑ Safeguarding watershed forests, typical for the western taiga, in the Tolvajärvi area as a mosaic of bright pine forests, eskers and lakes, and around Koitajoki as old-growth forests, rivers and mires.
- ❑ Protection of fine esker formations with steep slopes and esker-pits, beautiful lake views on 160 lakes.
- ❑ Offering refuge for some rare plants and fauna typical for taiga-wilderness. Tolvajärvi is the southernmost part of the living range of the forest reindeer
- ❑ Preserve and manage ancient settlements from the stone age in Kuolismaa, old fields of the former Karelian settlements with their folklore and memorials from the Winter War and Second World War
- ❑ Development of nature and culture tourism in the Tolvajärvi area keeping in mind the Environmental and Quality Principles of the Green Belt national parks
- ❑ Development of cross-border and other international co-operation in order to get international recognition, to facilitate visiting the park and to get support in developing it.

2. Regulation of the Park activity

The main task of a national park is the conservation of the natural and cultural heritage of the territory. All the activities shall be subordinate to that. The planning of the park activities should be based on scientific information and analysis. The participation of the local authorities is important for decision-making.

The primary actions both allowed and prohibited in national parks are adjusted by the model "Regulation of a National Park" (August 10, 1993). Specific features of each Park are reflected in its Regulation, and annual plans of the Park to be approved by its Director. All this information is included in the Regulation of the Park, which is brought to the attention of visitors through information boards, leaflets and mass media.

2.1. General regulation

Hereby, a Regulation is proposed for the Koitajoki-Tolvajärvi National Park. According to it, the following activities are forbidden in the National Park:

- ❑ any action threatening ecosystems and objects of history and culture;
- ❑ geological surveys and mining actions;
- ❑ actions changing the hydrology (melioration, channelling, construction of dams, etc.), timber floating, and other ways of water contamination;
- ❑ construction of trunk roads, pipelines, electricity lines and other communications not related with the work of the National Park;
- ❑ making new farmland and summer cottage co-operatives;
- ❑ construction of apartment houses, cottages, recreation centres not related with the infrastructure of the Park;
- ❑ construction of roads, pipelines, electric lines or digging down cables not related to national park or frontier guard activities;
- ❑ conduct of mass sports and entertainment events;
- ❑ organisation of campsites, placement of tents, making fire outside designated places;

- ❑ movement and parking of motor vehicles outside roads and waterway routes of general purpose and designated parking spaces;
- ❑ clear cuttings and resin-tapping, felling of trees without permission of the Park Director;
- ❑ landing of aircraft outside equipped landing sites and water areas;
- ❑ hunting of game animals, catching, shooting and causing death to all species of animals (except for fish with fishing licence), destruction and damage to their habitats and nests, intentional interfering with these animals (across the whole territory of the Park);
- ❑ collection and destruction of rare and endangered plant species;
- ❑ gathering of herbariums and collections (insects, minerals, mushrooms etc.) without a permit from the administration of the Park;
- ❑ introduction of species of animals and plants alien to Park's ecosystems (except for greenery management in the visitor service zones);
- ❑ destruction or damage to objects of historic or cultural importance. In the Park, it is prohibited to commercially use flora and fauna resources, and timber resources;
- ❑ leaving litter in nature and living untidy in cabins and campsites of the Park;
- ❑ use of pesticides and mineral fertilizers;
- ❑ contaminating of rivers and lakes

To ensure the functioning of the Park, conserve the diversity of species and communities and to create conditions for the stay and recreation of visitors, a series of activities are possible, even if they are forbidden above. Their timing and methods are worked out in the annual plans of the Park's activities.

The following actions are allowed in the Park:

- ❑ construction and repair of roads (except for the strictly protected and special protected zones);
- ❑ making of hiking trails with field marking, foot bridges on mires, bridges across streams, fireplaces in campsites, overnight accommodations, toilets, garbage collectors;
- ❑ construction of camping grounds with parking lots, campsites, maintenance facilities, apartment houses for the Park staff and maintenance personnel;
- ❑ construction of piers for small-size vessels, repair and storage hangars (recreation zone and visitor service zone);
- ❑ construction of electricity supply lines and communications to camping sites;
- ❑ carrying out of forest cuttings (selection, landscape, tendering, rejuvenation) in the forestry sub zone and felling a small number of trees elsewhere when it is necessary for making firewood for fireplaces or opening of trails and campsites (except for the strictly protected and special protected zones);
- ❑ small-scale farming in the agriculture sub zone;
- ❑ sports and amateur fishing by license issued by the North Ladoga Fishing authorities;
- ❑ collection of wild berries and mushrooms, and ground parts of some plants as medical material (except for the strictly protected and special protected zones). However, this activities can be regulated by the decision of the Park Director.

The supervision of the Regulation of the park is the responsibility of the Park Director and belongs to the tasks of all park staffers. Besides that, the park inspectors have authorized rights to stop illegal activities in the Park and arrest the violators.

2.2. Regulation of nature use in the National Park

MINING OF NATURAL RESOURCES

This activity is prohibited in the National Park. At the same time, the creation of the Park infrastructure calls for road repairs, building of parking spaces, making routes and major construction at sites of former villages (Kuolismaa, Tolvajärvi), which means a large need in ground. To reduce costs, the main part of mining for these purposes is advisable close to the border of the buffer zone and the surrounding territory, and within the buffer zone but in small amounts.

FORESTRY

In the Koitajoki-Tolvajärvi National Park forestry is allowed only in the management zone. Not even there are commercial cuttings possible. Felling of some trees in order to make firewood for fireplaces, to open trails or campsites etc. is here not considered as forestry. Cuttings shall always be based on the needs of the park management, however, not on needs to increase income of the park.

Following types of forestry are possible within the management zone:

- ❑ landscape cutting and cleaning of forest clutter along hiking trails to improve the aesthetic and recreational attractiveness of the routes, also to decrease the fire risk; decoration planting in the recreation areas and along hiking trails, removal of trees around observation points to permit better view of the Park's territory;
- ❑ cleaning of rides and roads, marking of boundaries;
- ❑ cleaning of new hiking trails and winter roads for snowmobiles;
- ❑ cutting for inventory purposes (model trees, trees for compartment posts);
- ❑ cutting for fire-prevention purposes along roads, agricultural lands, recreational objects – cleaning and digging of fire trenches, mineralised strips;
- ❑ cleaning of shrub under transmission lines;
- ❑ thinning of stands made of introduced species;
- ❑ making firewood for tourist needs in specially designated areas. The best places would be burnt areas along roads and shores. Cleaning of burnt areas to produce firewood will improve the aesthetic value of the landscape and promote forest recovery processes. It is necessary to give up making firewood outside specially designated places where deadwood and fallen trees are found because they serve as habitat for a large group of organisms associated with deadwood and extinct in well-cared commercial forests. Timber production and making firewood to meet needs of the Park is done in the management zone and regulated by the logging rules in force
- ❑ cutting on overgrown agricultural lands;
- ❑ cutting for construction of rangers' stations, cabins, shelters, etc.
- ❑ forestry actions aimed at ensuring natural reforestation on clearings and burnt plots.

AGRICULTURE

Agriculture can be practiced in the agriculture sub zone in the park. The main objectives are restoring cultural landscapes and the production of organic products. This means the restriction of the use of pesticides and mineral fertilizers in favour of organic fertilizers. Hay making and clearing of overgrown pastures is allowed and welcomed to preserve the traditional rural landscapes in all functional zones except the strictly and specially protected zones. Preference shall be given to small field machines, it is desirable to revive the use of horses which could be used to ride the visitors.

HUNTING

All forms of hunting are forbidden in the national park.

FISHING

No changes are to be expected to fishing for local people. Fishing is regulated in accordance with the "Temporary Fishing Rules in the Republic of Karelia"(2000). The volume of annual catch is agreed with State Fishery Committee (Karelybvod). An agreement will be prepared between the NP and the Karelybvod about the practical arrangements of fishing: selling of licenses, seasonal quotas and supervision.

Quotas for fishing will be defined later together with the State Fishery Committee.

PICKING OF BERRIES AND MUSHROOMS

The picking of berries and mushrooms is allowed anywhere in the Park except for the strictly protected zone.

GATHERING OF MEDICINAL HERBS

The commercial collection of medicinal herbs and raw material in the park is prohibited. Collection for personal use is allowed anywhere in the park except for the strictly protected zone in accordance with the list of species permitted for gathering. Picking of medicinal herbs which are listed in the Red Books of Europe, Russia, Karelia and East Fennoscandia is prohibited everywhere.

TOURISM

Along with environmental protection, tourism is one of the tasks of the National Park. The precondition for tourism development is the vast recreational potential of this territory in tourism types (land and waterway) and tourism areas: sports, recreational, ecological, educational (above all for schoolchildren and students), complex, etc.

Tourists should register with authorised representatives of the Park and agree the plan of their stay, including the type of recreation, time and location. This information is required by safety rules for tourists. One of the preventive measures can be instruction on how to behave on Park's routes, or

guidance by Park's qualified workers. This especially concerns waterway tourists and those who plan long multi-day trips both in summer and in winter.

There is no limit to the stay of tourists in the recreation, visitor service and management zones on Park's routes, in the free access zone and the buffer zone. If outside these zones, tourists should be recommended to stick to roads, trails, rivers and lakes as a guiding line. To implement this statement, it is necessary to give out leaflets with a map of the NP to tourists as an enclosure to the entry pass. The map should contain all marked linear objects, zone borders, signposts, infrastructure elements and routes.

Tourists are not allowed to visit the frontier zone, strictly protected zone and special protected zones of the national park.

During the registration procedure, Park's visitors from other regions of Russia and foreigners should pay an entrance fee to the administration of the Park for the stay in the Park, general instruction, leaflet and access to facilities (sheds, fireplaces, firewood, toilets). All other services, such as guidance, interpretation, tourist equipment (boats, tents, bicycles, etc.), comfortable accommodation, sauna and other services should be covered separately and towards that person or organisation (leaseholder, tourist companies or the Park admini

ECOLOGICAL EDUCATION

Ecological education is closely connected with the organisation of tourism in the Park. The main distinction is that groups of students (schoolchildren, students, trainees, etc.) should be freed from charges for the stay in the National Park and free-of-charge licensed fishing on angling rod or flying rod should be allowed to them. As for payments by these visitors for the use of the logistics of the NP (lodging, boating, etc.) and excursions, this is a question to be discussed with the Park administration on an individual basis.

RESEARCH

The National Park serves as an important object for scientific and research actions. This is accounted for by the status of the protected area and the availability of relevant elements of infrastructure. Any research action not related with damage to objects of history and culture may be allowed in the Park, if agreed with the Park administration.

To obtain a permit to conduct research in the Park, scientists and research teams should submit a standard methodical note, plan of operations and funding plan to the administration of the Park. After discussing and making an affirmative decision a contract is made between the administration and an applicant institute or researcher on conduct of research. In case if funding of research is done by the applicant only, then the Park administration may require for a concise report on the most significant outcomes.

Scientific research should not be constrained in the strictly protected or special protected zones, but it should be endorsed with the Park administration and regulated by rules of the NP if an entry pass is obtained.

As a special condition the special entry pass should contain information about the sites and regime of visiting them, and as concerns research of monitoring of fish and small mammals - ways and tools of fishing should be indicated.

The Park administration may control observance of the rules by scientists and availability of passes for conduct of research actions.

2.3. Functional zoning

According to the Russian Federation's Nature Protection Act of February 15, 1995, functional zones are issued separately for each national park. The location of functional zones in National Parks is done on the base of assessment of every uniform area, with taking in the view the following factors: level of anthropogenic transformation and the nature conservation importance of the area, scenic features, vulnerability to man's impact, tourist and recreation potential, etc.

Principles for the functional zoning are taken from the Nature Protection Guidelines (Section X "Organization and Design of Nature Protected Areas" of "Temporary Guidelines on Composition, Procedure of Development, Agreement and Approval of Pre-design and Design Documentation for National Parks of the Federal Forest Service (of July 14, 1993), pp. 395-396).

The general structure of functional zones is as follows:

1 – Strictly protected zone is aimed at regeneration of particularly valuable natural complexes and sites where no recreation or management is allowed.

The total area of strictly protected zones is defined from the principle of conditions needed for the existence of protected floras and fauna species. Decisions on their location in a Park and their total area are made on the base of local conditions and should be defined by environmental situation;

2 – Recreation zone where conditions for sightseeing and short relaxation are provided. The main part of tourist routes with sightseeing grounds, tracks and camping sites with shelters, fireplaces supplied with firewood, sign-posts, information boards and schemes of sight location, is laid there.

Territories allocated for outdoor activities and tourism should be defined from the perspective of overall and educational values and availability for tourist actions, and minimising the threat to conservation values.

Visitor services in this zone are organized by a network of recreation facilities (cabins, shelters, wilderness huts), tourist routes of different lengths, fitness levels and content:

3 – Visitor service zone where camping grounds, hotels, motels, tent camps, excursion bureau, nature museum, information centres, catering businesses, trade enterprises, other cultural and household facilities, playing grounds are located;

4 – Management zone where management not discrepant with the objectives of the National Park is performed.

5 – Other zones, based on the local conditions and peculiarities.

The area and borders of functional zones of a National Park are determined upon the results of environmental and recreational value analysis. At this, the most vulnerable and least impacted by the anthropogenic activity territories which are inhabited by typical, rare and endangered species and regions of flora and fauna, are to be included into the strictly protected or special protected zones. The most resistant for recreational impact and attractive ones can be located to the recreation zone. Splitting of natural regions (landscapes) into different zones is inadmissible.

Local conditions are to be taken into consideration when designing functional zones. New zones can be drawn up whenever it is necessary. However, the functional zoning should be simple enough for everyday management and for the visitors' understanding.

To exclude the direct contact of the National Park with intensively utilised territories and, consequently, to prevent a negative impact of the latter on the nature of the Park, a buffer zone shall be designed outside the park proper, along the boundaries of the Park. The mean width of the buffer zone shall be at least 1-1,5 km.

The key task of the zoning of a national park is to find an optimal ratio and territorial organisation of sites aimed at different targets. Observance of the optimal balance when applied to national parks means that the scheme of zoning should perform the basic functions of a NP: 1) conservation of the most valuable nature areas in natural state, 2) wide use of recreational resources and development of tourist business profitable for the region, 3) creation of opportunities within a small area for partial use of wood and other resources needed for successful management of the Park and local population.

The foundation for the zoning was made of outcomes of a complex inventory (Materials of Inventory., 1998), including landscape and ecological zoning (map of landscapes). This data allows differentiating the area of the Park through a set of parameters (structure and dynamics of nature areas at the level of individual and isolated sites of 5 000 to 10 000 ha).

2.3.1. Functional zones of the Koitajoki-Tolvajärvi National Park

The National Park has following functional zones:

FRONTIER ZONE

The special frontier zone located between the state border and the border fence has a frontier strip 2 km wide. Even for frontier guards, access is strictly regulated there. In the Park (Koitajoki sector) this strip occupies 8,2% of the total area. This is where areas of primary forest are concentrated. The total area of the special frontier zone ranging from 5 to 14 km is about 23 850 ha (31,1% of the Park's area), i.e. it covers the largest part of the Koitajoki area. The zone is based on the federal law "State border of the Russian Federation". Its allocation is necessary for the observance of the border regime and does not depend upon the activity of the Park. This strip will actually play the role of a buffer zone between the adjacent to the borders of the National Park intensively developed Finnish territory and the main part of the primary forest stands on the Russian side.

Officially, the special purpose strip will be situated within the Park, but in practice this plot will be inadmissible for visitors. Scientific work may be possible in this territory. Forest management will not be possible there due to strictly controlled visiting regulation. A clearer regulation of the Park activity in this zone might be developed only after negotiations with the federal headquarters of the frontier guards. Thus, in the near future the wilderness regime will be in effect in this area, with some exclusion (factor of disturbance from patrolling the border).

REGULATION IN THE FRONTIER ZONE

There is no access for visitors without permission from the Frontier Guard and Park Director. Utilization of natural resources is forbidden with three exceptions: picking of berries and mushrooms is allowed for the Frontier Guard staff and fishing is allowed for them with the permission of the Park Director. Scientific research is possible with the permission of the Frontier Guard and Park Director. All kinds of forestry and felling of trees is forbidden except when required for frontier guarding. Construction and repair of buildings, constructions, border fence and electrical lines is possible when it is necessary because of the border control. The Park Director shall be informed in advance about these kinds of activities.

STRICTLY PROTECTED ZONE

The strictly protected zone covers **3 369 ha (4,4 % of the total area)**. The zone is intended for the preservation of natural ecosystems in their natural state. It covers compartments in the eastern and western parts of the Tolvajärvi area (fig. 11).

No nature use actions are allowed in the strictly protected zone, including recreation activity. Research is allowed, especially monitoring over the state and spontaneous dynamics of nature complexes. Limited research tourism is possible (in small groups, in non-nesting periods, with a guide, etc.).

The boundaries of the Strictly protected zone will be marked in terrain by signs, which show the border and refusal to access.

REGULATION IN THE STRICTLY PROTECTED ZONE

There is no access for visitors to the Strictly Protected Zone. Only scientists and the park staff can move there with the permission of the Park Director. All kinds of utilization of natural resources are forbidden there. Forestry, including felling of separate trees is forbidden. Construction of buildings, roads or facilities is forbidden. Naturally evoked forest fires are not to be extinguished before they come out of the zone.

SPECIAL PROTECTED ZONE

The special protected zone embraces sites of high environmental value but where nature areas are slightly disturbed. The zone includes three sites from the Tolvajärvi sector:

- ❑ an area of denudation-tectonic hill-ridge landscape with the dominance of spruce forest, within which a high concentration of rare and endangered species of plants and animals have been recorded. The site fringes the western strictly protected zone. The area of the site is 3 259 ha (fig. 10, 11; table 15).
- ❑ a site to the north of Lake Hirvasjärvi with a water-glacial complex, eskers overgrown with pine stands in combination with mires and lakes. The site is characterised by an abundance of rare and endangered species of plants and animals. The area of the site is 522 ha (fig. 10; table 15).
- ❑ a site with the similar landscape. It adjoins Lake Yla-Tolvajärvi from the east. The site is of large value for protection odd rare species of animals. The area of the site is 69 ha (fig. 11; table 15).

REGULATION IN THE SPECIAL PROTECTED ZONE

Access for visitors as well as scientific research is allowed with the permission of the Park Director, mainly with guide from the park staff. All kind of utilization of natural resources is there forbidden. Forestry, including felling of separate trees is forbidden. Construction of buildings, roads or facilities is forbidden.

RECREATION ZONE

In the Koitajoki area the recreation zone is located east of the border fence. The territory is poorly accessible and suitable for hiking and other recreational activities in wilderness conditions. In Tolvajärvi the recreation zone is situated in the central and the most scenic part of the area. Here the zone is suitable for hiking and boating, mushroom and berry picking and fishing, and it is 13 403 ha,

which is 17,5% of the whole NP on both western and eastern side of the central part. If we include the zone of educational tourism located eastwards and westwards of the Tolvajärvi recreational zone and eastwards of the Koitajoki frontier zone, then the territory open for visitors will be 55 262 ha, or 72% of the Park's area.

REGULATION IN THE RECREATION ZONE

There is free access to this zone. Staying over night and making fire is allowed only in designated places or as instructed by the Park Director. Scientific research is possible with the permission of the Park Director. Picking of berries, mushrooms and herbs and fishing are allowed here as in the park in general. Forestry is forbidden, but the felling of trees in order to prepare a small amount of firewood for fireplaces and to open trails and campsites is possible. Construction of buildings and roads is forbidden, but cabins and facilities for visitors and cabins for supervision can be constructed and trees felled for the purpose. Using of snowmobiles is allowed on trails.

VISITOR SERVICE ZONE

Visitor services zone provides accommodation, camping grounds, sports grounds and other facilities of tourist services, information boards and catering services. thus all the camping grounds with services (shelters, cabins, road connection etc.) belong to this zone. the area in each plot is small. the zone occupies the territory of the former villages of kuolismaa and tolvajärvi and is intended for location of tourist, cultural, household and informational services for visitors. the total area of the zone is 27 ha (17 ha in the tolvajärvi area and 10 ha in the koitajoki area), which amounts to 0,04% of the total area of the national park.

REGULATION IN THE VISITOR SERVICE ZONE

There is free access to this zone. Staying over night and making fire is allowed only in designated places. Scientific research is possible with the permission of the Park Director. Picking of berries, mushrooms and herbs and fishing are allowed here as in the park in general. Forestry is forbidden, but felling of trees in order to prepare a small amount of firewood for fireplaces and to open trails and campsites is possible. Construction of buildings, roads and all kind of

MANAGEMENT ZONE

Management zone provides possibility for the park to get timber and firewood, and to revive traditional farming. The total area of the zone makes up to 41 859 ha (54,6% of the Park's area). It consists of two sub zones:

- **Forestry sub zone**, located in the ecological tourism zone, which occupies 41 822 ha or 54% where some environmentally feasible forestry operations, aimed at producing timber for the Park and local population, are allowed;

Regulation in the Forestry Sub zone. There is free access to this zone. Staying over night and making fire is allowed only in designated places. Scientific research is possible with the permission of the Park Director. Utilization of natural resources is allowed here as in the park in general. Hay-making and grazing of animals in meadows is allowed. Forestry is possible here when it is necessary for the park management. Commercial forestry is not allowed. Construction of buildings and roads is forbidden, but facilities for visitors can be constructed.

- **Agriculture sub zone** is designated for traditional farming, which is possible on old villages, where the fields are now overgrowing (area of 37 ha or 0,05% of the Park's area). The agricultural sub zone is established in order to manage old cultural landscape, favour typical flora and revive traditional farming by cultivating organic products. New settlement in the agricultural sub zone is possible on contractual basis.

Regulation in the Agriculture sub zone. There is free access to this zone. Staying over night and making fire is allowed only in designated places. Scientific research is possible with the permission of the Park Director. Utilization of natural resources is allowed here as in the park in general. Forestry is possible here when it is necessary for the park management. Commercial forestry is not allowed. Small-scaled agriculture is possible with natural fertilizers and without pesticides. Hay-making and grazing of animals in meadows is allowed. Construction of roads, traditional Karelian houses, facilities for visitors and cabins for supervision is possible. New settlement in former villages in this sub zone is possible on contractual basis as for ownership and management principles.

Table 15

List of compartments by forest range, included in the functional zones

Forest range	Functional zones	Compartments included in the zones (p=partially)	Area, ha
Koitajoki area			
Kuolismaa	Educational tourism	5p, 6p, 12p, 13p, 14, 21p, 22p, 23, 24, 34p, 45p, 46p, 47p, 48p	8 523
Kuolismaa	Visitor service	34p	10
Kuolismaa	Frontier zone	5p, 6p, 11, 12p, 13p, 20, 21p, 30, 31, 32, 33, 34p, 42, 43, 44, 45p, 46p, 47p, 48p, 146-170	23 855
Total for the Koitajoki sector			32 388
Tolvajärvi area			
Tolvajärvi	Strictly protected	51p, 69p, 70p, 101p, 122p	1 974
Tolvajärvi	Special protected	51p, 52p, 53p, 54p, 69p, 70p, 71p, 73p, 74p, 75p, 126p	3 850
	Recreation	54p, 55p, 56, 57, 58p, 73p, 74p, 75p, 76, 77p, 103p, 104p, 105, 106, 107pp, 115p, 116, 117p, 118p, 124p, 125, 126p, 132p, 133, 134p	13 403
Tolvajärvi	Visitor service	103p, 104p	17
Tolvajärvi	Educational tourism	58p, 77p, 107p, 117p, 118p, 126p, 127, 134p, 53, 54, 55p, 71p, 72, 73p, 102p, 103p, 104p, 113, 114, 115p, 123, 124p, 131, 132p	9 658
Vegarus	Educational tourism	16-18, 29, 30, 31p, 32p, 42, 43, 44p, 45p, 55, 56, 57p, 58, 58-70, 81	23 678
Vegarus	Strictly protected	31p, 32p, 44p, 45p, 57p, 58p,	1 395
Total for the Tolvajärvi sector			44 317
Total for the Park			76 705

3. Location of facilities

ROAD NETWORK

No new roads are needed in the Koitajoki sector. The existing net of roads, paths and the river entirely provide for access to the territory either on foot or by any transportation vehicle (fig. 12, 13). However, it should be noted that the quality of roads in the Koitajoki NP is very poor. Even roads along the special frontier zone and road from Kuolismaa over the state border to Ilomantsi are not always passable for small-size and medium-size cars. The sections of the roads towards the camping sites (visitor service zones) also need repair and reconstruction.

It does not look reasonable to construct new roads in the Tolvajärvi sector, either. The existing roads and paths make it possible to reach any area. Paths are good for hikers. To create better conditions for car and motorcycle tourists many resources are needed to repair and restore roads and bridges. In particular, a bridge in Ristisalmi (road Tolvajärvi-Vegarus-Suojärvi) is out of use and should be reconstructed. A capital repair and substitution is needed for a bridge in the source of the River Tolvajoki (the northern end of the outdoor recreation zone of the Tolvajärvi sector, fig. 12, 13).

There are plans to establish a new cross-border point in Haapovaara with limited possibility for border crossing of tourist. The road from Suojärvi town to Haapovaara would go between the Koitajoki and Tolvajärvi sectors, through the buffer zone of the park. Due to the closeness of Värttilä-Niirala international cross-border point, the new cross-border point will perhaps not be established in near future. However, it would facilitate access to the National Park and increase the number of visitors.

The accessibility of the Koitajoki sector from the Russian side can now be recognized as satisfactory (i. e. passable for small-size and medium-size cars) only on the road Suojärvi-Lahkolampi-Porosozero-Kuolismaa. The shorter road Suojärvi-Vegarus-Jakunvaara-Kuolismaa has a number of very poor parts and passable for off road cars or in the dry season of the year for Russian passenger makes (fig. 12).

The shortest way between the Koitajoki and Tolvajärvi sectors is through the Vegarus settlement. It is 75 km long and in quite a good state. In the meantime, access to the most part of the Koitajoki sector is constrained due to special frontier regime, and a pass entry is needed.

Three car parking lots are needed in the Koitajoki area:

1. the clearance on the place of the former Kuolismaa settlement (a camping in the centre part of the waterway route),
2. In future, when the Park has the basic infrastructure, two more parking lots could be advisable in this part of the Park.
3. in the northern part, where the waterway starts on the Russian territory,
4. in the south-west, in the area of the abandoned Ontrovaara settlement (northern part of the shore of Lake Ala-Vieksjärvi), where the Russian sector of the River Koitajoki ends (fig. 12).

As for the second car parking, the additional observation of sites for its organisation should be made or the project could be rejected because the road along the border is rather far (6 km). The third perspective parking lot is not accessible currently for cars of any class due to ruined road along the north eastern shore of Lake Ala-Vieksjärvi.

At the moment, the opportunities for transit border crossing for tourists by water vehicles and their move on the Russian section of the River Koitajoki is regulated by the Frontier Guards of the Russian Federation.

Transport accessibility of the Tolvajärvi sector can be recognized as satisfactory after the road repair made within two Tacis projects. The road from Värtsilä to Tolvajärvi was repaired in 1999 and a distance of 13 km of the road Raikonkoski – Tolvajärvi in 2000. On the contrary, the road from Suojärvi through Vegarus is out of order: the road is in poor condition and the bridge at Ristisalmi is burned (see fig. 12,13).

Three car parks are needed in the Tolvajärvi sector:

1. The main parking will be placed in the Tolvajärvi settlement,
2. Parking by Ristisalmi Channel, i. e. on the western and eastern borders of the recreation zone, along the main road.
3. car parking is placed by a bridge, in the beginning of the Tolvajärvi River, where it could service hikers and boating tourists (fig. 13).

PARK OFFICE

The Park Office is located in the town of Suojärvi, the district centre, which is connected by railway and car transportation with all districts of Karelia, the Leningrad Region and Finland. The office premises of about 150 sq. m should be hired in the central part of the town. In the park budget there is a reservation for repairing the premises so that about 20 workstations can be located here. Later on construction of own premises is possible. All the heads of the departments, the whole administrative, tourist and scientific departments will work here. Besides this, garage and storage of about 150 sq. m are needed close to the office.

VISITOR CENTRE

In order to inform visitors about the nature of the National Park, nature conservation in general and how to behave in nature, a Visitor Centre will be constructed in the Tolvajärvi village. Its final location will be defined when the land use plan for the former settlement and infrastructure there is prepared. An exhibition is designed together with a professional designer, scientists and park staff. The Visitor Centre will serve as a place that will be visited by practically all visitors.

INFORMATION POINTS

Information points consist of stands or boards, which are located outdoors, close to the camping grounds, car parks and starting points of the trails. There are no guides present here, and the information can be studied from the stands and boards at any season. The basic information of the park is presented in different combinations: map, regulation and information of the spot. The information stand is consisting of 5-10 information boards in size A0. Usually a roof covers it. An information board consists of 1-2 boards in open air, preferably sheltered from direct sunshine.

Information points are located as follows:

1. Kuolismaa village, information stand on the camping ground
2. Tolvajärvi gate, information boards on the camping ground
3. Ristisalmi, information boards on the camping ground
4. Koitajoki gate, information boards
5. Tolvajoki, information boards on the camping ground

6. Kotisaari, information boards on the campsite
7. At the beginning of each hiking trail

ACCOMMODATION

There are plans to reconstruct the former small hotel, which was built on an esker between lakes Hirvasjärvi and Koti-Tolvajärvi in 1939 and which was destroyed during the Winter War. There are two main alternatives for the project: whether the park gets funding and will accomplish it or some private investor will do the work. The reconstruction of the house might be too large a work for the new NP, but however the work will be done, the following shall be taken into consideration:

1. It shall be a reconstruction work according to the old drawings and pictures. A new house without historic background cannot be constructed here
2. Contract of hiring the plot and an agreement of the ownership and use must be clear before starting the construction work
3. House shall be open for visitors, it may not be closed or impede the activities of the NP

Camping grounds are areas for service and accommodation for visitors. There is a road connection, tent sites, one or several shelters for accommodation, sauna, fireplace, shelter for firewood, toilet, litter bin, parking lot, often also a small pier at camping grounds. There are always park personnel present on camping grounds to serve visitors and guarantee the safety of their property. There will be six camping grounds in the park:

1. Tolvajärvi gate
2. Tolvajärvi village
3. Kuolismaa gate
4. Kuolismaa village
5. Ristisalmi
6. Tolvajoki

In the four camping grounds of Tolvajärvi and Kuolismaa villages, Ristisalmi and Tolvajoki, five cabins of about 40 sq.m are constructed in each to accommodate visitors of the park. The capacity of a cabin is 8 persons. The cabins in Tolvajärvi are meant for all-year-around use, elsewhere they are only for summer use. Cabins are rented for visitors on a short-term basis (max. 1 week).

On Kotisaari island on lake Koti-Tolvajärvi **a campsite** is constructed. It is equipped with less service than camping grounds. In this plan, campsites are places where tenting is possible and some simple services as fireplace, firewood, table and bench, toilet are available. Use of campsites is free of charge. They are regularly served and supervised by the park staff.

HIKING TRAILS

The Koitajoki-Tolvajärvi National Park, especially the Tolvajärvi sector is suitable for hiking. The forests are fairly easy to walk, eskers form natural paths and the landscape with many lakes is beautiful.

On each hiking trail there are some fireplaces, benches and signs to show the route where needed. Most of the trails have their start at a camping ground, if not so there is an information point and parking lot in the beginning of the trail. Some of the trails can be equipped as ecological trails, each with its own theme. These trails can have information signs in nature or a small booklet can be prepared. Ecological trails are useful for teaching school children, but they can also open the eyes of grown-ups on nature and nature conservation (fig. 14).

The following hiking trails have already been or will be designed and constructed in the Park:

Name	Start	Length in km	Facilities
Myllyjärvi*	Tolvajärvi village	5	1 fire-place with benches, 10 signs
Ristisalmi*	Tolvajärvi village	10,5	2 fire-places with benches, 20 signs
Taikinajärvi*	Ristisalmi	8,5	2 fire-places with benches, 15 signs
Myllyjärvi	Old hotel	5	1 fire-place with benches, 10 signs
Tornilehto	Hirvasharju	10	2 fire-places with benches, 20 signs
Kuohajärvi	Ristisalmi	15	3 fire-places with benches, 30 signs
Tolvajärvi eskers	Ristisalmi	10	2 fire-places with benches, 10 signs
Lehtisenjärvi ???	Tolvajärvi village	8	2 fire-places with benches, 10 signs
Matkalampi	Tolvajoki	10	2 fire-places with benches, 10 signs
Tolvajoki	Tolvajärvi village	12	2 fire-places with benches, 10 signs
Haapovaara	Tolvajärvi village	15	2 fire-places with benches, 10 signs
Surioja	Tolvajärvi village	6	2 fire-places with benches, 10 signs

* existing route, planned and constructed by the small Tacis project CBCSPF/IMSEDIGIS/RK/9803/094 in 2000

WATER ROUTES

Water routes find the largest attractiveness among tourists because they allow the opportunity to get acquainted with practically any part of both sectors of the Park within the recreation zone. Their best advantage is a possibility to get by boat to any area of the lake-river system without dragging the boat on land. Now, there is no need to regulate water routes since visitors should orient on existing and planned campsites and campgrounds of the Tolvajärvi sector. In Koitajoki, permission from the frontier guards is needed for visiting areas behind the border zone (fig. 15).

WINTER ROUTES

A limited amount of snowmobiling is possible in the park, but the trail shall be followed. From the point of view of nature conservation, skiing is a better way to get acquainted with nature in winter, and skiing should be favoured by the park administration.

The most promising winter route, according to local experts, is a two-day snowmobiling route Tolvajärvi – estuary of the Koitajoki River – southern shore of Lake Ula-Vieksjärvi – former Jakunvaara settlement in the northern direction, and in the southern (backward) direction – Jakunvaara settlement – eastern shore of Lake Vaksausjärvi – Tolvajärvi of the total length at 70 km with an overnight in Jakunvaara. A skiing trip on this route will take 5 to 7 days and require intermediary overnight stays.

4. Personnel and administration of the Park

4.1 Personnel

When the park is established, the land, waters and forests are moved to the ownership of the national park. The territory of the Koitajoki-Tolvajärvi National Park is wide, it represents a piece of the most beautiful part of Russia. Thus it is natural, that the personnel of the park must be skilful professionals with appropriate equipment and they have to be able to take the responsibility of this property of the whole nation. The administration and management is not serving only environmental functions but to effectively develop activities of the Park given by the legislation in force and other normative documents.

The structure and park staff is determined according to "Regulations on National Parks in the Russian Federation" No 769 of August 10, 1993, approved by the Decree of the Ministry Council of the Government in the Russian Federation, and "Temporal typological structure of a National Park" (Annex 1 to Decree of the Federal Forestry Service of the Russian Federation No 59 of March 22, 1994).

The total number of staff is 43 persons, divided in five departments. The following structure and personnel is proposed for the national park.

Task	Officers	Nr of pers.	Grade	Year* of hiring
Administrative department		6		
Management of the park activities, economy, activity planning, reporting, personnel policy, contracts, legal matters, permissions for visitors, telecommunications, training of staff	Park Director	1	18	1
	Assistant manager	1	15	2
	Legal adviser	1	15	5
	Chief accountant	1	17	1
	Secretary	1	4	1
	Cashier	1	4	1
Department of forestry and protection of natural and cultural heritage		17		
Nature protection, protection of historical objects, forestry, supervision of the park territory, construction and maintenance of houses and facilities, fire fighting	Deputy Director	1	17	1
	Constr. engineer	1	12	2
	Inspector	5	9	1
	Forest ranger	5	8	3
	Constructor	5	8	2
Tourism Department		11		
Development of tourism products and services, marketing, selling, production of information material, ecological education, organisation of guiding, visitor centre, booking of cabins, creation and maintenance of electronic communications	Tourism chief	1	17	1
	Economist	1	11	2
	Marketing expert	1	15	2
	Computer engineer	1	14	2
	Guide	5	15	3
	Secretary	1	4	2
	Teacher	1	15	5

Task	Officers	Nr of pers.	Grade	Year* of hiring
Scientific Department		3		
Carrying out of inventories and research related to park management, develop research activities, keep contact with research institutes, interpreting of scientific information to other departments and planning active nature management, maintain files about the species and ecosystems of the park	Scientific director	1	16	1
	Scientist	2	13	3
Department for supporting services		6		
Transport services, maintenance of vehicles and equipment, assistance in construction work, supporting the other departments, waste disposal, cleaning of premises	Transport chief	1	12	1
	Driver	3	7	1
	Technician	1	4	1
	Office cleaner	1	4	2
Total		43		

* Year of hiring shows the year after the establishment of the NP when the persons in question shall be hired.

The annual salaries of the whole park personnel make up to 890 000 Rbls on a salary level of January 1, 2001. The salaries include a senior bonus of 20%, district coefficient of 40% and northern coefficient of 80%.

For the successful management of the national park it is important to utilise the skills and knowledge local people have of the natural and cultural heritage of the park territory. It is natural that local people who know the wilderness and its dwellers have a priority when field personnel for the park is employed.

4.2 Administration working methods and local participation

The administration of the Park is guided in its operations by normative and legal acts of the Russian Federation. To develop tourist infrastructure, the Park is establishing partnerships with all stakeholders, enterprises, and entrepreneurs. To preserve the natural and cultural heritage in the protected area, the Park develops co-operation with many environmental and non-governmental organisations from both Russia and abroad. When discussing issues related with the socio-economic life of the Suojärvi District, the administration agrees its actions with the local authorities, the Governments of Karelia and Russia. The Park management joins the existing network of fruitful cross-border co-operation along the Green Belt.

National parks are federal organisations, strictly controlled in their planning and reporting systems to normative acts. In spite of that, it is very important for the park director to create good and functioning relations with the people and the local administrations, where the park is situated. From the beginning the park administration should apply participatory methods and be extremely sensitive to hearing local points of view and apply them whenever they are not in contradiction with the park objectives. The Park should actively learn from the local knowledge of nature management and history, collect it and use for Park management and environmental education. The Park should not unnecessarily restrict the traditional rights of the villagers.

Particularly, in developing tourism the plans and investments should be in line with the surrounding territories. When hiring employees to the park and preparing contract with tourism operators, the park can offer job opportunities for local people. The national park should take seriously all local tourist entrepreneurs, who would like to take groups to the park. Instead of setting obstacles, the NP should encourage their activities within the limits of the park regulation. Good co-operation with all stakeholders and neighbours is necessary for smooth development of the NP.

The organisation of visitor services is carried out in compliance with Russia's Protected areas Law (1995, Article 17). Regulated tourism and recreation in the Park is realised in accordance with approved projects on the base of licenses allowing tourist and recreational activities.

5. Organisation of the main activities of the Park

5.1. Protection of natural and cultural heritage

Pursuant to Regulation on Russia's National Parks (1993, chapter 5) a differentiated regime of protection, conservation and use is to be established in the National Parks with a focus on their local natural, historical and cultural, and social features. The Park administration defines marginal tourist traffic in the Park.

The most important objective of national parks is the protection of natural and cultural heritage. In line with this purpose, regulations of the Park and rules for visitors have been elaborated. According to official documents about "Decrees of National Parks" regulations of national parks are provided with a department for the protection of natural and cultural heritage. In this park the department of forestry is combined with that one. The department has the responsibility of supervision, even if it is also belonging to the tasks of each park staff, whenever seeing or hearing something relevant from the point of view of supervision.

The administration of the Park and its departments are co-operating with federal authorities of protection of different nature resources (water, fish, animals), security services and frontier guard. Public inspections could also take part in protection of a national Park.

Federal inspectors have specific rights to control activities and prevent infringements of the Park regulations. Experts of this service have the right to use guns in extreme situations.

The main duty of inspectors is to supervise the park territory so that all illegal activities are impeded. Particularly, in a national park the Park Regulation and the regulations in the functional zones are the main targets of supervision. It is organised so, that patrols cover the whole of the park territory, but is more frequent in areas where people are moving actively or where access is easy by car or boat. The reproduction period of animals, hunting and fishing seasons, dry seasons in summer are to be taken as special challenges for the inspectors.

Due to the dominance of forests, fire prevention and fighting are important in order to protect the natural and cultural heritage of the NP. Forest fires, mainly originating from the careless handling of fire by visitors, has in 1990s been a serious problem in the park. The aim is fire prevention improvement of the territory to allow preventing fires if such occur, timely detection, localization and extinguishing. They are organised in compliance with "Guidelines on Fire Prevention Projecting..., 1982".

The forest cover of the National Park is characterised by dry pine forests on shores, which feature high fire danger. If a fire puts up during the fire-risk period, one may surely forecast free expansion of fire on large spaces. The only barriers could be open outcrops, waters and roads. However, even these barriers do not guarantee localization of fire, in particular this regards crown fires. Thus, fire prevention facilities are needed, which would allow timely spotting, localization and putting out fire.

The key element of fire prevention actions is prohibition of making fire outside specially designated places. Fireplaces are established across the territory of the Park and supplied with firewood. Visitors are presented with a detailed map where all these sites are located (including those marked in the field) and instructed on making fires and sanctions to be applied to violators is a must in the Park. This operation will require little costs while if it is adequately organised this will ensure minimization of fire risks.

Detection of fires. In case of too small investments, detection of fires will be done by any of the park's staff moving in the park or by a well-developed information system, organised by the municipal authorities.

Fire fighting. During the fire risk period a group of staff is appointed and equipped with fire extinguishing tools. The equipment needed is always available close to good communications.

There are still some open meadows left in the park, partially overgrown by bushes and broad-leaved forests. Fields were actively cultivated during the Finnish settlement until 1930s. After that only here and there some agriculture has taken place, nowadays there is no agriculture left.

Some of these meadows should be kept open in order to maintain the old cultural landscape on the villages. There are also some rare plants and plant communities on these meadows, followed by interesting fauna. The area of the meadows is approximately 37 hectares. An inventory should be carried out so, that the most valuable meadows from the point of view of cultural landscape, history, flora and fauna, could be identified. After that an action plan to manage meadows should be prepared. The plan should show the areas, objectives and methods for meadow management. The main approaches will certainly be haymaking and pasture with cows and sheep. Also possibilities for new

agricultural settlement in the park should be clarified. The park regulation may not close the door for this kind of park management.

The management can be carried out on a limited, most valuable part of the meadows with help of agricultural companies, private farmers and voluntary workers. In best cases some income from meadow management can be possible.

5.2. Ecological education

Ecological education is one of the main tasks of this national park. The objectives of that is to organise training in different forms for school children, students and grown ups. Training of teachers, trainees and guides is a part of the activity. The headlines of training are ecology, environmental issues, local nature, good behaviour in nature etc. So far ecological education is a task of the tourism department. In the long run the Park should have a separate department of ecological education with the aim to co-operate with educational institutions, federal and regional authorities, mass media. International funds and non-governmental organisations should be attracted for the ecological education development.

In this plan, no special constructions are proposed for ecological camps in the park. However, it would be natural to use some of the camping grounds in summer for ecological camps of children. The Visitor Centre is naturally serving school children with special programs and the ecological trails will be constructed taking children into consideration.

For achieving the objectives, it is expedient to create permanent contacts to the schools in Suojärvi, Sortavala, Petrozavodsk and other settlements, and to engage specialists from the Republican ecological centre, Small forest academy, higher education institutions and research centres. Summer apprentices in the form of students from different institutes can be engaged in the work of ecological camps.

5.3. Scientific research

Research activities of the park are regulated by "The Decree on National Parks of the Russian Federation" (1993). It is aimed at "...development and implementation of scientific techniques of preserving biological diversity, natural, historical and cultural complexes, and forecast of ecological environment in the region". Research is possible on the whole territory of the park, including the strictly protected and special protected zones. Permission of the Park Director is needed, whenever the access to these protected zones or any other measures exceeding what is allowed for ordinary visitors, is expected. The Scientific Board of the park coordinates research so, that the co-operation between the park and researchers will advance in a way with mutual benefit. The park administration shall request annual reports from the scientists who are working in the park. Special attention should be paid when reporting the information in spatial form so, that it can be utilised in the Geographical Information System of the park.

The staff of the park, and – upon a contract carries out research – by research organizations, higher education and vocational training institutions of relevant profiles. External organizations must agree the research with the administration of the park.

During the first phase of park's existence research activities should be concentrated on inventory work. Many of the valuable habitats and endangered species in the park are still unknown. At the same time, momentum must be built for long-term monitoring by means of facilitating training grounds, stations and test sites etc.

Subjects of research must be balanced with the needs of the park. The park administration needs information about the natural and cultural heritage of the Park. This information is essential so, that the park can do its best in allocating resources and avoiding mistakes in management. Information is also needed in tourism development, training of guides and ecological education. Preparation of popular scientific publications about nature, cultural and historical heritage of the park, booklets describing tourist trails and tourist routes with expert description of all natural sights, and recommendations on rational natural resource utilization and park's biodiversity conservation will be one of the major results of research activities.

5.4 Tourism

Due to the character of the Koitajoki-Tolvajärvi National park, the main attractions are concentrated in the Tolvajärvi area. It was popular already in the 1930s and again since the middle of the 1990s. The main attractions for visitors are:

- Shores and eskers of the lakes. They are very pleasant terrain for picnics and hiking. Also picking of berries and mushrooms is common.
- Lakes and rivers suitable for canoe and rowing boat tours. Local people are frequently fishing here.
- Old battle fields and former settlements. They are visited by people, whose ancestors are from here or who are interested in war history.

The park is located close to the border, there is only about 45 km from the Tolvajärvi sector to the Värtsilä international cross-border point. The total number of visitor-days is estimated to be about 2 000 in the whole territory in the year 2000. Practically all of them come to the Tolvajärvi part of the park. A rough estimation is that 500 days are spent by fishermen, 400 by stray visitors on picnic, 200 by collectors of berries and mushrooms, 100 by culture tourists, and the rest canoeists and others. Due to a scientific expedition, about 50 visitor days can be allocated for scientists.

This national park has an opportunity to be the main tourist attraction of the whole Suojärvi district. Tourism here is still in a developing stage: lack of tourism infrastructure facilities is evident in the district, there is only Karelia Hotel with few conveniences, and "Forest Clearing" Spa owned by the "Zapkareles" joint-stock venture. Catering, cultural institutions and public recreation areas are poorly developed.

6. Action Plan for the five first years of the Koitajoki-Tolvajärvi National Park

6.1 The priority actions

The most urgent tasks for the first five years of the Park's activity are:

1. creation of the administration with the departments,
2. to get the park territory under control in terms of supervision
3. to repair the access roads and bridges to the Park
4. to start planning and realising infrastructure (office, visitor centre, ranger stations, camping grounds, hiking trails etc.),
5. to start designing information material for visitors,
6. tourism development and inclusion of the Park into the network of tourism business

The list of investment planned for the Park is given in the Annex. Below, there is a short list of the main actions to be fulfilled in the first five years of the Park work.

Table 16
Plan of actions for a five-year period

Year	Main actions for each year	Remark
1	Creation of the National Park's administration by hiring the first seventeen employees	Park director, heads of the future departments, five inspectors and some others
	Agreeing with the Municipal Enterprise of Tolvajärvi about handing over of the equipment purchased by the Tacis project ENVRUS9704	See a separate list of equipment
	Finding office premises for the park in Suojärvi, starting and fulfilling the repair	
	Providing the office with furniture and equipment needed	
	Purchase vehicles and tools	
	Designing of an individual; Karelian construction style for the NP and a general plan for the Visitor Centre	Architectural planning
	Start designing information cabins, camping ground and campsites	Architectural planning
	Start training the staff, particularly inspectors to know the territory	To be done by a special team of workers of the NP
	Repair the roads to Kuolismaa and from Raikonkoski to Tolvajärvi	

Year	Main actions for each year	Remark
2	Hiring twelve more persons in the park administration	Including 5 constructors
	The NP takes in use a practise to hire annually temporary workers for the season May-October	Mainly constructors, guides
	Creation of Tourist Department	Tourist Dept will be established as a separate result unit in order to follow the economy of tourism
	Creation of the other departments	
	Preparing and forwarding the Koitajoki-Tolvajärvi National Park Regulation	
	Design the plan of Visitor Centre	Architectural planning
	Start constructing the first camping grounds	
	Start constructing the first hiking trails	
	Repair the Kuolismaa road and finalise the repair of the Raikonkoski road	
	Purchase more vehicles and equipment	See the full list in the Annex
	Continue training of personnel, particularly that of tourist department	External trainees should be used
3	Hiring twelve more persons in the park administration	Five guides, five forest rangers, etc
	Start planning information material for info boards and leaflets	Park staff together with experts
	Purchase more vehicles and equipment	See the full list in the Annex
	Repair the road Tolvajärvi-Ristisalmi	
	Repair the road to Tolvajoki and repair the Ristisalmi bridge	
	Constructing the second camping ground	
4	Constructing the second hiking trail	Park staff together with experts
	Prepare information material of the NP	
	Prepare program packages for visitors	See the Tourism Strategy of the Karelian Green Belt
	Start marketing of the park with co-operation with entrepreneurs and tour operators	Model contract taken in use
	Prepare a plan for scientific work in the NP including a monitoring program	By the Scientific Department of the NP, co-ordination in the Scientific Board of the NP
	Prepare a recurrent training program for the park staff and take it in use	By the Administrative Dept.
	Set up information boards with relevant information of the NP and its regulation	
	Constructing the third camping ground	
	Constructing the third hiking trail train	Park staff together with experts
Repair the Tolvajoki bridge		
5	Hiring two more park employees	
	Start designing and manufacturing souvenirs of the NP	By professional designer
	Purchase more vehicles and equipment	See the full list in the Annex
	Constructing the fourth camping ground	
	Constructing the fourth hiking trail train	Park staff together with experts
	Designing of an exhibition for the Visitor Centre	Tolvajärvi Village
	Start constructing the Visitor Centre	
	Start marking the NP borders and Strictly protected zone in terrain	

6.2 Business Review for the Kalevala National Park

6.2.1 Need of Funding

A rough budget estimate is prepared based on realising the most important and urgent parts of this plan. This budget is for the five first years of the park (Table 17) and it is presenting the need based on experience of other, Russian national parks. The circumstances can still change before the park is established. Some of these activities can have been realised already before by the Municipal Enterprise and also new investments can appear, for example with the help of unexpected external funding.

Table 17

The estimated expenses of the national park during the first five years

	First year in 1000 Rbls	Second year in 1000 Rbls	Third year in 1000 Rbls	Fourth year in 1000 Rbls	Fifth year in 1000 Rbls
Running costs					
Salaries of permanent staff	366	553	736	825	888
Salaries of temporary staff		100	200	200	300
Purchase of services	200	200	200	200	200
Rent of premises	120	120	120	120	120
Office expenses	10	20	30	40	40
Service & maintenance of vehicles	50	50	100	100	100
Maintenance of Park Infrastructure		100	200	250	300
Travel expenses	20	40	80	80	80
Telecommunication	50	10	10	10	10
Training of staff	20	40	40	40	40
Subtotal	836	1233	1716	1865	2078
Investments*					
Equipment, tools	560	1340	200	0	30
Facility construction	100	2007	2107	741	1213
House repair & construction	2150	645	270	2500	3400
Road repair & construction	1500	2570	2000	1250	0
Vehicles	250	250	0	0	0
Subtotal	4560	4781	4577	4491	4643
Total	5396	8045	6293	6356	6721

* Details of the investments can be seen from the List of investments in Annex

There will be some income from the park activities. All income will be invested in tourism development, because a national park cannot be and should not show any profit of its activities. In order to follow and develop the economy of tourism, the tourism department of the park should be established as a separate result unit. It means that the department has its own budget and accounts, which help to recognise all the expenses and incomes originating from tourism activities.

All these incomes are possible only if the park, especially the infrastructure and services, will be developed approximately according to the guidelines of this plan. Before the park establishment the Municipal Enterprise of the Tolvajärvi has already some equipment, which can produce income for it. Boats, snowmobiles and minibus for transport generate some income. On the investment list attached to this plan, there is time scheduled the purchase of one more boats, some canoes, snowmobiles and two more minibuses, which all support tourism development together with some saunas and rental cabins.

Table 18

The estimated incomes of the Koitajoki-Tolvajärvi National Park during the first five years

All figures are gross incomes, the corresponding expenses are included in the expense table above.

Year	First year in 1000 Rbls	Second year in 1000 Rbls	Third year in 1000 Rbls	Fourth year in 1000 Rbls	Fifth year in 1000 Rbls
Entrance fee					
- to the NP	0	10	20	30	30
- to Visitor Centre	0	0	0	0	50
Transports					
- boat, car	250	250	300	300	500
Renting					
- cabins	50	100	100	150	150
- canoes and rowing-boats	49	98	150	200	240
- other equipment	0	10	17	25	30
Selling of products					
- tour packages	20	40	80	120	150
- souvenirs, postcards etc	1	2	3	5	10
Total	370	550	700	850	1130

There will be an income fee to the Koitajoki-Tolvajärvi National Park. The grounds for the fee will be defined later.

6.2.2 Funding sources

At least in the beginning, the main source of funding is budget income from the Federal Budget for the national parks. However, the Koitajoki-Tolvajärvi National Park has good possibilities for getting so called external funding. In the best case, this can cover a part of the investments during the first decades of the park.

So far the establishment of the Koitajoki-Tolvajärvi National Park has been supported by the Finnish Ministries of Environment and Agriculture and Forestry (supported inventories) and the European Union through two Tacis projects: so called small Tacis project with the name "**Development of the Suojärvi District as a model area for sustainable development with the example of international Biosphere reserve in Finnish and Russian Karelia**" and a larger one "Karelia Parks Development". In the latter one this territory was one of five target areas to be developed.

In future the Koitajoki-Tolvajärvi National Park can get more external funding through projects funded by foreign or domestic bodies. There are some preconditions, which are of great importance when this kind of co-operation is considered by the funding party:

1. the park is working purposefully
2. there are clear and well prepared plans of the park activities and they are followed
3. the park gives a reliable impression of itself
4. the park has realistic plans, preferably even skilfully prepared documents of future projects
5. communication and co-operation with the park is easy
6. the park administration holds a high esteem training, environmental education, good management
7. the park has good relations with the local administration.

Due to the location of the park close to Finnish, and European Union, border, it is expected that some new projects with external funding will be initiated in the next future.

Table 19

The need of budget funding and external funding in accomplishing this plan can be estimated as follows:

	First year in 1000 Rbls	Second year in 1000 Rbls	Third year in 1000 Rbls	Fourth year in 1000 Rbls	Fifth year in 1000 Rbls
Running costs	-836	-1233	-1716	-1865	-2078
Investments	-4560	-6812	-4577	-4491	-4643
Income	+370	+550	+700	+850	+1130
Need of budget and external funding	-5026	-7495	-6993	-5506	-5591

The Koitajoki-Tolvajärvi National Park has a good opportunity to increase its annual income year by year. It is expected that this favourable situation will continue, perhaps even improve after the first five years. Without the risk of overrating the chances, it can be appraised that after about ten years work the income of own activities (mainly selling of services) may exceed that of budget funding. This optimistic prognosis can be explained with following:

1. there are good chances to develop tourism in the territory
2. due to closeness of border and St. Petersburg, plenty of potential clients are close
3. the park has already now got a good start in tourism, before the visitors really have found the territory. This start can be utilised and even improved with the quick establishment of the national park so, that wild tourism can be got under control
4. the park is in the Green Belt, which is about to be developed as a brandy in nature tourism

Annexes

1. References
2. Environmental and Quality Principles for the Green Belt national parks
3. List of investments
4. The Items of Equipment and Material handed over to Tolvojarvi Municipal entry

Annex 1 References

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Annex 2

Environmental and quality principles for the Green Belt national parks

1. Sustainability must govern

All the actions of the park shall base on sustainable use of resources. Some examples:

Tourism should be adjusted to natural limits, i.e. what nature and culture can tolerate

Wearing of nature should be followed all the time

Facilities should be allocated so, that the harm for nature can be minimised

Waste disposal should work effectively

2. Conservation of natural and cultural heritage is the main task

When planning activities, knowledge of natural and cultural values of the park should get priority. Tourism is subordinated to the main task. This principle should be followed for example in following cases:

“Don’t sell their lives!” Rare and timid animals can suffer from tourists who want to come to close.

Park should prepare information of nature and nature conservation

Co-operation with scientists is important in increasing knowledge of nature

3. Tourism should benefit local people and local economy of the region

The national park should be open for co-operation with the neighboring communities. This would maximize the benefits for both parts. For example:

Park relies on accommodation, transport and other services of the villages nearby

Park recruits workers from the region

Tourism is developed in co-operation with local administration

Park has well functioning liaison with local entrepreneurs

4. Quality in planning and construction of the park

When the national park is developed, it is important to use professional planners, preferably such who know the area and culture there.

All facilities should be carefully planned in advance and the plans followed

Local style in constructions gives a catchy memory in visitors’ minds

Roads and trails, cabins and campsites should be well adapted in the landscape

Broken constructions should be repaired immediately

5. Highly qualified guides are needed in every park

Guides meet visitors and guests of the park. Their work has an essential role in building up the image of the park. Some principles to be followed:

Local guides have many advantages, train their skills in client oriented service

Use also expertise of scientists working in the park to train the guides

Adopt a positive attitude to visitors

6. Tour programs should respect local traditions and environment

Both programs of the park and the tour operators should have connection to the local history and traditions. These are also interesting hear about for the visitors.

Well planned tour programs promote nature conservation, at least in increasing the knowledge of the visitors

Find out old stories, interview old people, use local guides

The park should make written contracts – with instructions about following these principles - with tour operators

7. Punctuality and reliability is appreciated

In the long run, only punctual and reliable actors can survive in tourism business. In national parks this is referring for example to following issues:

Quick and prompt answers to questions

Reservations and prices always hold.

Guides and transports are punctual

8. Always guarantee the safety of visitors

Visitors are expecting that they can trust the arrangements and be sure about their personal safety. It is important that:

No risks are taken in wilderness, on water or road

There is always a reserve plan for bad weather or unexpected incidents

Visitors and their property is always in safe and they know it

9. Supervision is attending on everybody

Effective supervision is needed in every national park, but it must be carried out on a discreet way. Some hints:

Information about the park regulation should be available in advance and on the spot

Functional zoning should be available for visitors

Guiding and discussing attitude of the rangers leads to best result

10. Ask for response and comments from visitors

Comments from visitors are essential in developing the park and its services. It can be done many ways:

Regular inquiries at the park gate should be carried out every year

Guest books in cottages and www page can discover many important things

Be susceptible to the response, that is the best way to develop the park

Jouko Högmander

Annex 3

List of investments for Koitajoki-Tolvajärvi NP

Category	Content	Location	Activity	Nr. of units	Capacity	Length, m	Area, sq.m	Unit price, 1000 Rbls	Total price, 1000 Rbls	Year
Equipment	Fire-fighting		Field work	1				40	40	1
Equipment	Tools		Field work	10				10	100	1
Equipment	Furniture	Suojärvi town	Office	2				40	80	1
Equipment	Computer		Office	2				20	40	1
Equipment	Snowmobile		Tourism&super v.	2				150	300	1
Facility	Signpost	Around the park	Marking borders	200				0,5	100	1
House	Architectural planning	Around the park	Infrastructure	1				150	150	1
House	Repair	Suojärvi town	Office	1			400	5	2000	1
Road	Repair	Raikonkoski-Tolvajärvi	Access road	1		10000		0,15	1500	1
Vehicle	Off-road car		Field work	1				100	100	1
Vehicle	Micro-bus		Tourism	1				150	150	1
Equipment	Fire-fighting		Field work	1				40	40	2
Equipment	Tools		Field work	10				10	100	2
Equipment	Computer	Suojärvi town	Office	2				20	40	2
Equipment	Small motor boat		Supervision	4				65	260	2
Equipment	Canoe		Tourism	20				30	600	2
Equipment	Snowmobile		Tourism&super v.	2				150	300	2
Facility	Fence and swards	Tolvajärvi gate	Camping ground	1		500		0,1	50	2
Facility	Fire place	Tolvajärvi gate	Camping ground	2				1	2	2
Facility	Fire-wood shed	Tolvajärvi gate	Camping ground	1			10	1	10	2
Facility	Gate construction	Tolvajärvi gate	Camping ground	1			1	30	30	2
Facility	Litter-bin	Tolvajärvi gate	Camping ground	2				0,5	1	2
Facility	Parking lot	Tolvajärvi gate	Camping ground	1			2000	0,1	200	2
Facility	Pier	Tolvajärvi gate	Camping ground	1		10		1	10	2
Facility	Service centre	Tolvajärvi gate	Camping ground	1			60	8	480	2
Facility	Shelter	Tolvajärvi gate	Camping ground	1			10	2	20	2
Facility	Site planning	Tolvajärvi gate	Camping ground	1			5000	0,05	250	2
Facility	Table-bench	Tolvajärvi gate	Camping ground	2				4	8	2
Facility	Teepee	Tolvajärvi gate	Camping ground	2	8		15	2	60	2
Facility	Tent site	Tolvajärvi gate	Camping ground	1	60		1000	0,1	100	2
Facility	Toilet	Tolvajärvi gate	Camping ground	2			1	2	4	2
Facility	Information board	Tolvajärvi gate	Information point	2			1	10	20	2

Category	Content	Location	Activity	Nr. of units	Capacity	Length, m	Area, sq.m	Unit price, 1000 Rbls	Total price, 1000 Rbls	Year
Facility	Signpost	Around the park	Marking borders	200				0,5	100	2
Facility	Sightseeing tower	Tolvajärvi	Trail	1				200	200	2
Facility	Planning of trails	Two routes a year	Trail	2		10000		0,01	200	2
Facility	Fire place, table&bench	Two routes a year	Trail	6				5	30	2
Facility	Bridge	Two routes a year	Trail	2		30		0,5	30	2
Facility	Causeway	Two routes a year	Trail	1		2000		0,1	200	2
Facility	Information board	Two routes a year	Trail	2				1	2	2
House	Sauna	Tolvajärvi gate	Camping ground	1			30	5	150	2
House	Warehouse	Tolvajärvi gate	Camping ground	1			60	2	120	2
House	Repair	Suojärvi town	Storage	1			150	1,5	225	2
House	Architectural planning	Tolvajärvi village	Visitor Centre	1			150	1	150	2
Road	Repair	Kuolismaa	Access road	1		15000		0,15	2250	2
Road	Signpost	Main road	Access road	20				1	20	2
Road	Repair	Tolvajärvi-Ristisalmi	Access road	1		2000		0,15	300	2
Vehicle	Off-road car		Field work	1				100	100	2
Vehicle	Micro-bus		Tourism	1				150	150	2
Equipment	Rowing boat		Tourism	10				20	200	3
Facility	Fence and swards	Koitajoki gate	Camping ground	1		500		0,1	50	3
Facility	Fire place	Koitajoki gate	Camping ground	2				1	2	3
Facility	Fire-wood shed	Koitajoki gate	Camping ground	1			10	1	10	3
Facility	Gate construction	Koitajoki gate	Camping ground	1			1	30	30	3
Facility	Litter-bin	Koitajoki gate	Camping ground	2				0,5	1	3
Facility	Parking lot	Koitajoki gate	Camping ground	1			2000	0,1	200	3
Facility	Pier	Koitajoki gate	Camping ground	1		10		1	10	3
Facility	Service centre	Koitajoki gate	Camping ground	1			60	8	480	3
Facility	Shelter	Koitajoki gate	Camping ground	1			10	2	20	3
Facility	Site planning	Koitajoki gate	Camping ground	1			5000	0,05	250	3
Facility	Table-bench	Koitajoki gate	Camping ground	2				4	8	3
Facility	Teepee	Koitajoki gate	Camping ground	2	8		15	2	60	3
Facility	Tent site	Koitajoki gate	Camping ground	1	60		1000	0,1	100	3
Facility	Toilet	Koitajoki gate	Camping ground	2			1	2	4	3
Facility	Information board	Koitajoki gate	Information point	2			1	10	20	3
Facility	Signpost	Around the park	Marking borders	200				0,5	100	3

Category	Content	Location	Activity	Nr. of units	Capacity	Length, m	Area, sq.m	Unit price, 1000 Rbls	Total price, 1000 Rbls	Year
Facility	Sightseeing tower	Kuolismaa	Trail	1				200	200	3
Facility	Opening, marking	Two routes a year	Trail	1		10000		0,01	100	3
Facility	Planning of trails	Two routes a year	Trail	2		10000		0,01	200	3
Facility	Fire place, table&bench	Two routes a year	Trail	6				5	30	3
Facility	Bridge	Two routes a year	Trail	2		30		0,5	30	3
Facility	Causeway	Two routes a year	Trail	1		2000		0,1	200	3
Facility	Information board	Two routes a year	Trail	2				1	2	3
House	Sauna	Koitajoki gate	Camping ground	1			30	5	150	3
House	Warehouse	Koitajoki gate	Camping ground	1			60	2	120	3
Road	Repair	Tolvajoki	Access road	1		5000		0,15	750	3
Road	Bridge	Ristisalmi	Bridge	1		50		25	1250	3
Facility	Fire place	Tolvajärvi village	Camping ground	2				1	2	4
Facility	Fire-wood shed	Tolvajärvi village	Camping ground	1			10	1	10	4
Facility	Litter-bin	Tolvajärvi village	Camping ground	2				0,5	1	4
Facility	Planning	Tolvajärvi village	Camping ground	1			10000	0,05	500	4
Facility	Shelter	Tolvajärvi village	Camping ground	1			10	2	20	4
Facility	Table-bench	Tolvajärvi village	Camping ground	2				4	8	4
Facility	Sightseeing tower	Tolvajoki	Trail	1				200	200	4
House	Cabin, all-year-around	Tolvajärvi village	Camping ground	5	8		40	12,5	2500	4
Road	Bridge	Tolvajoki	Bridge	1		50		25	1250	4
Equipment	Exhibition design	Kuolismaa village	Information point	1			10	3	30	5
Facility	Fire place	Kuolismaa village	Camping ground	2				1	2	5
Facility	Fire-wood shed	Kuolismaa village	Camping ground	1			10	1	10	5
Facility	Litter-bin	Kuolismaa village	Camping ground	2				0,5	1	5
Facility	Planning	Kuolismaa village	Camping ground	1			10000	0,05	500	5
Facility	Shelter	Kuolismaa village	Camping ground	1			10	2	20	5
Facility	Table-bench	Kuolismaa village	Camping ground	2				4	8	5
Facility	Stand construction	Kuolismaa village	Information stand	1				10	10	5
Facility	Opening, marking	Two routes a year	Trail	1		10000		0,01	100	5
Facility	Planning of trails	Two routes a year	Trail	2		10000		0,01	200	5
Facility	Fire place, table&bench	Two routes a year	Trail	6				5	30	5
Facility	Bridge	Two routes a	Trail	2		30		0,5	30	5

Category	Content	Location	Activity	Nr. of units	Capacity	Length, m	Area, sq.m	Unit price, 1000 Rbls	Total price, 1000 Rbls	Year
		year								
Facility	Causeway	Two routes a year	Trail	1		2000		0,1	200	5
Facility	Information board	Two routes a year	Trail	2				1	2	5
Facility	Opening, marking	Two routes a year	Trail	1		10000		0,01	100	5
House	Cabin	Kuolismaa village	Camping ground	5	8		40	5	1000	5
House	Exhibition design&constr.	Tolvajärvi village	Visitor Centre	1			100	6	600	5
House	Construction of V.C.	Tolvajärvi village	Visitor Centre	1			150	12	1800	5
Facility	Fire place	Tolvajoki	Camping ground	2				1	2	6
Facility	Fire-wood shed	Tolvajoki	Camping ground	1			10	1	10	6
Facility	Litter-bin	Tolvajoki	Camping ground	2				0,5	1	6
Facility	Parking lot	Tolvajoki	Camping ground	1			200	0,1	20	6
Facility	Pier	Tolvajoki	Camping ground	1		10		1	10	6
Facility	Planning	Tolvajoki	Camping ground	1			5000	0,1	500	6
Facility	Shelter	Tolvajoki	Camping ground	1			10	2	20	6
Facility	Table-bench	Tolvajoki	Camping ground	2				4	8	6
Facility	Teepee	Tolvajoki	Camping ground	2			15	2	60	6
Facility	Tent site	Tolvajoki	Camping ground	1			1000	0,1	100	6
Facility	Toilet	Tolvajoki	Camping ground	4			1	2	8	6
Facility	Information board	Tolvajoki	Information point	2			1	10	20	6
House	Cabin	Tolvajoki	Camping ground	5			40	5	1000	6
House	Sauna	Tolvajoki	Camping ground	1			30	5	150	6
House	Sauna	Tolvajoki	Camping ground	1			30	5	150	6
Facility	Fire place	Kotisaari	Camp site	2				1	2	7
Facility	Fire place	Kotisaari	Camp site	2				1	2	7
Facility	Fire-wood shed	Kotisaari	Camp site	1			10	1	10	7
Facility	Litter-bin	Kotisaari	Camp site	2				0,5	1	7
Facility	Pier	Kotisaari	Camp site	1		10		1	10	7
Facility	Planning	Kotisaari	Camp site	1			5000	1	5000	7
Facility	Shelter	Kotisaari	Camp site	1			10	2	20	7
Facility	Table-bench	Kotisaari	Camp site	2				4	8	7
Facility	Teepee	Kotisaari	Camp site	2			15	2	60	7
Facility	Tent site	Kotisaari	Camp site	1	60		1000	0,1	100	7
Facility	Toilet	Kotisaari	Camp site	4			1	2	8	7
Facility	Information board	Kotisaari	Information point	2			1	10	20	7
House	Sauna	Kotisaari	Camp site	1			30	5	150	7
Facility	Fire place	Ristisalmi	Camping	2				1	2	8

Category	Content	Location	Activity	Nr. of units	Capacity	Length, m	Area, sq.m	Unit price, 1000 Rbls	Total price, 1000 Rbls	Year
			ground							
Facility	Fire-wood shed	Ristisalmi	Camping ground	1			10	1	10	8
Facility	Litter-bin	Ristisalmi	Camping ground	2				0,5	1	8
Facility	Parking lot	Ristisalmi	Camping ground	1			200	0,1	20	8
Facility	Pier	Ristisalmi	Camping ground	1		10		1	10	8
Facility	Planning	Ristisalmi	Camping ground	1			1000	0,1	100	8
Facility	Shelter	Ristisalmi	Camping ground	1			10	2	20	8
Facility	Table-bench	Ristisalmi	Camping ground	2				4	8	8
Facility	Teepee	Ristisalmi	Camping ground	2			15	2	60	8
Facility	Tent site	Ristisalmi	Camping ground	1			1000	0,1	100	8
Facility	Toilet	Ristisalmi	Camping ground	4			1	2	8	8
Facility	Information board	Ristisalmi	Information point	2			1	10	20	8
House	Cabin	Ristisalmi	Camping ground	2	10		40	5	400	8
House	Sauna	Ristisalmi	Camping ground	1			30	5	150	8
		Total							33442	

Annex 4

The Items of Equipment and Material handed over to Tolvojarvi Municipal entry

№	Description of Item	Number of Individual Items	Cost (E)	
			Unit	Total
1	Office computer unit	1	1722,25	1722,25
3	Fax machine	1	300,00	300,00
4	Copying machine (park offices)	1	1240,00	1240,00
5	Furniture, park offices	1	983,00	983,00
6	Vehicle, Niva (diesel)	1	13000,00	13000,00
7	Vehicle, Sobol (diesel)	1	9900,00	9900,00
8	Supplementary vehicle equipment	1	3700,00	3700,00
9	Raft	1	2550,00	2550,00
10	Inflatable boat (5-6 seats)	1	2050,00	2050,00
11	Canoes	3	600,00	1800,00
12	Plastic oar boats (4 m)	3	744,43	2233,30
13	Boat engines 3 hp	3	785,00	2355,00
14	Snow mobiles, Buran	3	2475,00	7425,00
15	Sledges	3	566,00	1698,00
16	Snow plane	1	339,00	339,00
17	Trailer	1	1359,00	1359,00
18	Digital maps (set)	1	2012,40	2012,40
19	GIS unit (computer+printer)	1	2301,00	2301,00
20	Licence, Run Time MapInfo	1	1111,22	1111,22
21	Satelite images (set)	1	581,00	581,00
22	Satelite images (set#2)	1	415,26	415,26
23	Tools and electric instruments (set)	1	6128,00	6128,00
	Petrol operated chain saw 2,7 horse powers	2		
	Chains	5		
	Hand electric circular saw 1000 Watt	1		
	Petrol operated aggregate 2500 Watt	1		
	Electric compressor for tire inflating 12 Volt	1		
	One-phase electric welding equipment 140 A + electrodes pack	1		
	Electric bush-cutter 1,5 horse powers	1		
	Electric drill (perforator) 500 Watt	1		
	Electric portable cutting-off machine 115-125 mm. 800 Watt	1		
	Electric plane 500 Watt 82 mm.	1		
	Electric tool-grinding machine 650 Watt 76 x 457 mm.	1		
	Electric polishing machine with uninterrupted belt 600 Watt	1		
	Mini wood-working machine 2500 Watt (joiner's bench 1 meter)	1		
	Set of carpenter hand tools	1		
	Set of bench tools (insulated hafts)	1		
	Set of spanners	1		
	Set of drills for metal	1		
	Set of drills for wood	1		
	Industrial safety outfit (helmet, eye-protecting spectacles, sound-proof ear-protection, voltage indicator)	5		
	Barking knife	2		
	Log pinsers	3		

№	Description of Item	Number of Individual Items	Cost (E)	
			Unit	Total
	Scribe	2		
	Level	2		
	Tape-line	1		
24	Tuorist equipment (set)	1	5822,00	5822,00
	Tent Orion 2l	3		
	Tent Zima U	2		
	Sleeping bag Goby	10		
	Backpack Canyon 85k	10		
	Life jacket	10		
	Accumulator torch	3		
	Tourist rug	10		
	Stainless pot, 8l	5		
	Rope, 12 mm	1		
	Safety helmet for snowmobiles	3		
	Raincape	2		
	First-aid box	3		
Grand Total				71025,43