

9 Management Impacts

Nature reserves represent national treasures comparable to museums, archives and libraries. The Nature Conservation Act specifies that the main function of protected areas is to preserve, for the benefit of present and future generations, sufficient representative and ecologically viable examples of all the ecosystems and habitat types that naturally occur in Finland, including their geographical variants and their natural developmental stages. Conservation work aims to create a comprehensive and ecologically representative network of protected areas.

Protected areas have great significance in terms of achieving and maintaining favourable conservation statuses for Finland's typical biotopes and species, and especially for endangered species and habitats. The Natura 2000 network is designed to protect biotopes, species' habitats and areas of importance for bird life that are declining at EU level. Finnish sites for the Alpine and Boreal Regions of the Natura network were approved in 2003 and 2005, respectively. The Habitats Directive obliges member states to establish Special Areas of Conservation (SACs) of these areas as rapidly as possible, at the latest within six years of their final approval, which for Finland means by 2012.

In addition to biodiversity, protected areas are also intended to conserve natural beauty and wilderness-like environments. The indigenous Sámi people have a special status in this context, as do other traditional forms of land use and cultural heritage. Within limits defined by conservation objectives, the protected area system should also promote research and the monitoring of the state of the environment, environmental instruction and education, awareness of nature, hobbies related to natural history, and the enjoyment of sustainable recreational activities in natural settings. The protected area network also helps to create opportunities for nature tourism and sustainable regional development.

Nature reserves, wilderness reserves and hiking areas in State lands represent many of the finest examples of nature in Finland. They are subject to many varied and often conflicting expectations. The Nature Conservation Act and the legislation passed to establish protected areas

express society's main reasons for conserving such areas, and the principles according to which they should be managed and used.

As the administrator of protected areas Metsähallitus has the challenging task of harmonising society's expectations. This task is incorporated into Metsähallitus's legally defined social obligations, which are:

- to consider biodiversity
- to provide opportunities for recreational use of nature
- to preserve conditions for reindeer husbandry and Sámi culture
- to promote employment.

The most important actions taken to achieve objectives related to protected areas are:

- establishing protected areas
- surveying and monitoring their natural and cultural values
- planning the management of areas
- restoring and managing natural and cultural sites
- providing facilities and services for hikers and other customers.

It is important for Metsähallitus to be able to monitor the impacts of protected area management and evaluate, or enable others to evaluate, how well society's expectations have been met. There are not yet many tools available to measure the effectiveness of management in this context, but efforts are being made to develop such tools.

9.1 Realisation of Statutory Objectives

9.1.1 A Relatively Comprehensive and Representative Network

National conservation programmes aim to comprehensively and representatively safeguard all of Finland's natural habitat types. In general, the most valuable examples have been selected for protection. Some 9-10% of Finland's total area is now under protection, counting legally established protected areas, including nature

reserves established under the Nature Conservation Act and wilderness reserves established under the Wilderness Act. If other areas reserved for nature conservation programmes are also counted (including Natura sites), the total area under protection increases to 15%. By the end of 2005, about three-quarters of the total area included in nature conservation programmes had been realised.

Target of 10% for ecosystem protection difficult to reach

It has been suggested on the basis of various international research findings that to maintain biodiversity in Finland at its present level, a conservation goal should be set aiming that about 10% of the total area of each of the main habitat types found in Finland should be protected. It is not enough to reach this goal at national level alone, however. To ensure that species continue to thrive, suitable habitat must continue to be available at a scale enabling the population of each species to remain large enough. Some species may require extensive areas of unfragmented habitat, while others may need habitat patches that are ecologically interlinked.

The SAVA Project, as described in Section 4.3.4, assessed the ecological representativeness of Finland's network of protected areas at the turn

of the millennium with regard to forests, mires and inland waters. The need for conservation in the forests of Southern Finland and Ostrobothnia was also examined in detail by the ESSU working group. Sections 5.2-5.5 elaborated the state of natural environment for each broad habitat type on the basis of the evaluation of first National Action Plan for Biodiversity in Finland (1997-2005), also assessing how comprehensively and representatively the present network of protected areas conserves the remaining biodiversity of Finland's ecosystems.

This review of each main habitat type indicates that at a national level the internationally defined target of a 10% protection level can be reached with the help of the existing protected area network for almost all of the main habitat types, although for forest and shore habitats Finland falls a few percent short of the target, depending on how the percentages are calculated (see Table 36). But, when levels of protection are assessed for each vegetation zone, the concentration of protected areas in the north means that targets are not completely reached in the south. Figures 21, 22 and 27 clearly illustrate how the levels of protection for forests, mires and inland waters are much higher in Northern Finland. The very limited levels of protection for natural old-growth forests, nutrient-rich spruce mires and wooded pine mires in Southern Finland are par-

Table 36. Total extents and conservation degrees of the main Finnish habitat types in 2005. The total areas include Finland's territorial waters and the Exclusive Economic Zone. The conservation degree estimates encompass protected areas designated in conservation programmes including Natura 2000 sites. Source: Hildén et al. 2005.

Main habitat type	Area (1,000 ha)	Percentage of total area	Percentage of total land area	Estimated conservation degree
Forests	14 876	35	49	8%*
Mires	8 528	20	28	13%
Rocky habitats and eskers	523	1	2	10%
Fells	1 513	4	5	100%**
Inland waters	3 367	8	0	20%
Baltic Sea	8 165	19	0	14%
Shores	800	2	3	3%/16%***
Agricultural environments	2 748	7	9	traditional agricultural biotopes 18%
Built environment	1 465	4	5	?
Total	41 985	100	100	average 15%

* estimate only includes strictly protected forests in forestland and scrubland

** all significant fells are within national parks and wilderness reserves

*** 3% of coastal shores and 16% of lakeshores are protected

ticularly notable. The forests of Southern Finland are mainly privately owned, so new measures focusing on private forests are needed to improve the situation regarding their conservation.

Other deficiencies in the ecological representativeness of the protected area network, as noted in the SAVA Project and other research findings, also generally concern Southern Finland. Problems in the south include the small sizes and fragmented nature of protected forests, and the absence of natural structural features and disturbances from forest ecosystems in protected areas. Other deficiencies concern the ecological and hydrological integrity of mires within protected areas, and the limited areas of managed wetland habitats and cultural environments within protected areas. The few remaining traditional agricultural biotopes, for instance, today only account for less than one percent of Finland's agricultural environments, and only half of them are continuously managed. The best possible areas have been reserved for future inclusion in the various conservation programmes for different habitat types, but particularly where shores and bird wetlands are concerned, protective and management measures have still not been fully realised.

The designation of Natura 2000 sites for protection has improved the ecological integrity of established protected areas and also the representativeness of the ecosystems of inland waters and shores included in the protected area network. But many valuable biotopes and habitats of threatened species still remain unprotected. The key challenge in Southern Finland is to conserve the remaining biodiversity outside protected areas through other measures than the establishment of extensive new protected areas.

Ecological sites in managed forests support the protected area network

One key objective of Metsähallitus's land use planning is to conserve biodiversity by supporting the protected area network. Natural and ecological sites in commercially managed forests have been protected in practice in various ways. Some are strictly and permanently protected, while in others temporary or permanent restrictions may be applied to limit forestry practices. From a forestry perspective, such efforts to con-

serve biodiversity can be examined by looking at the timber volumes involved. This enables the calculation of theoretical costs of such conservation measures.

In the natural resource planning conducted for State-owned commercially managed forests administered by Metsähallitus during the late 1990s, more than 3,000 hectares of forest was designated as permanently protected forest, and these areas were transferred to the administration of the NHS in 2005. In landscape ecological planning over the period 1996-2000, ecological sites with a total area of 168,000 ha were defined, of which a fifth are habitats defined by the Forestry Act. Commercial forestry measures are no longer allowed in 129,000 ha of forest land previously used as commercially managed forest or recreational forest. Forestry measures are limited in 176,000 ha designated variously as landscape sites, capercaillie lekking sites, other game habitats and ecological corridors.

Over the years 2003-2005 additional areas in Southern Finland have also been protected. These amount to almost 5,000 ha and consist of valuable nutrient-rich mire habitats or heath forests with abundant decaying wood as defined in the conservation biology criteria applied in the METSO Programme. The dialogue conducted with the Finnish Association for Nature Conservation and WWF Finland resulted in the protection of areas of valuable old-growth forest in Northern Finland with a total extent of 120,000 ha. Two-thirds of these areas will be protected by establishing them as new protected areas or adding them to existing ones, while commercial forestry measures will otherwise be restricted in the rest.

The extents of natural and ecological sites delimited in Metsähallitus's commercially managed forests in 2006 are shown in Table 37 according to the various habitat types shown by research to be significant for threatened species. This overview omits forest habitats protected by the Forest Act, which are not included in these separate conservation decisions designed specifically to conserve biodiversity. The table shows that these measures are most widely directed at heath forests, especially those with old-growth forest. The amounts of old-growth forest thus protected in commercially managed forests correspond to about 20% of the area covered by the old-growth forest conservation programme (320,600 ha).

Wooded mires, especially spruce mires, are also widely protected.

According to the ESSU working group, the representativeness of vegetation types in established protected areas is highest for mesotrophic forest types. Only one percent (about 1,600 ha) of all of Finland's herb-rich forests are included in sites within various conservation programmes. The level of conservation of herb-rich forests and heath forests with such characteristics remains low, even though forest species associated with these habitats are known to be particularly under threat. 60% of the ecological sites protected within Metsähallitus's commercially managed forests are more eutrophic forest types and they thus compensate for the under-representation of such vegetation types in protected areas.

Of the natural sites protected in Metsähallitus's commercially managed forests, only 1,300 ha (about 1%) are true herb-rich forests. But it is hard to increase this area, since State-owned lands have very few herb-rich forests (just over 3,500 ha in all). In addition to the protected herb-rich forest areas shown in Table 37, a total area of almost 2,000 areas of such habitat is protected in sites defined under the Forest Act.

In addition to herb-rich forests, esker forests, burnt heath forests, wooded pastures and wooded meadows have all been defined ecological sites in Metsähallitus's commercially managed forests.

The total areas under such protection are small in terms of hectares, since such features are altogether scarce in State lands, and such biotopes also tend to change rapidly. The least protected forest habitats in Metsähallitus's commercially managed forests are dry and dryish heath forests, but such habitats are the forest types best represented in statutory protected areas.

9.1.2 Parks Fulfilling Their Purposes

National parks form the core of the protected area network

National parks form an important part of protected area networks all around the world. Although in many countries other protected areas in remote regions may be many times larger in extent, national parks generally contain the most important national landscapes and natural heritage values. Almost invariably national protected area systems have been initiated by setting up networks of national parks. The pioneer in this respect was the USA, where the first of the country's famed national parks were established as long ago as the late 19th century.

In Finland, national parks have been established from the 1930s onwards. At the end of 2005 national parks formed about a quarter of the whole national network of established protected

Table 37. Extents of and timber volumes in ecological sites identified in Metsähallitus's commercially managed forests, by habitats of threatened species, January 2006. Source: Metsähallitus.

Habitat type	No felling or only selective felling		Extended regeneration cycle		Sites where retention trees left standing	
	Area (ha)	Volume (m ³)	Area (ha)	Volume (m ³)	Area (ha)	Volume (m ³)
Old heath forests	65 415	9 586 227				
Other heath forests	37 158	3 916 928	12 636	1 399 556	8 456	799 468
Old-growth herb-rich forests	158	15 521				
Other herb-rich forests	1 165	150 768				
Esker forests	652	77 345				
Burnt forests					695	30 882
Forests, not specified	1 850	160 089				
Spruce mires	23 310	2 521 754	1 555	144 296	1 368	151 744
Pine mires	5 267	442 590	2 937	248 128	794	66 706
Wooded pastures and meadows	104	7 625				
Total	135 077	16 878 847	17 128	1 791 980	11 313	1 048 800

areas (including wilderness reserves) and half of the total area of established nature reserves (see Table 5, p. 50). There are 25 national parks in the region covered by NHS Southern Finland, 6 in Ostrobothnia and 4 in Lapland. The average sizes of these national parks vary greatly, however, from 5,500 ha in the south, through 14,000 ha in Ostrobothnia, to 164,000 in Lapland. Finland's forest and mire ecosystems are diversely represented in national parks. Arctic fell ecosystems are also well covered, but lake and marine habitats are less well represented in national parks, considering the total extents of these areas. Several national parks are directly adjoined by strict nature reserves that add to the core conservation areas formed by the national parks.

Most of the national parks, their extensions included, that were planned under conservation programmes have now been realised. Almost all established national parks are covered by management plans. At present it seems that no significant additions to the national park network can be expected, although active local interest groups are working to promote the establishment of a new national park along the shores of the Bothnian Sea.

National parks form an important network in socio-economic terms as well as ecologically. Some parks are among Finland's most popular tourist attractions, including Pallas-Yllästunturi and Urho Kekkonen in Lapland, Oulanka in the northeast, and Koli and the Archipelago National Park in Southern Finland. These parks all contain landscapes considered as national treasures as well as other valuable cultural heritage. Many other parks have at least regional significance in terms of tourism. A total of more than 1.5 million visits to the 35 national parks (including Koli) were recorded in 2005. Tourism related to national parks has considerable impacts on local economies and businesses.

The NHS runs a dozen visitor centres around the country located near one or more national parks. These centres work to present the natural and cultural features of national parks in various accessible ways. They constitute valuable attractions and resources for tourism and education, and help visitors to parks to gain much more from their visits. Many of these centres have also become focal points for local cultural events and organised activities related to nature.

Wilderness reserves help to preserve traditional livelihoods

Finland's statutory wilderness reserves differ fundamentally from the stricter Anglo-American concept of wilderness. Lapland's wilderness areas have been used for centuries by the inhabitants of nearby villages for reindeer grazing, hunting and fishing. The 12 wilderness reserves established under Finland's Wilderness Act of 1991 aim to preserve the wilderness-like nature of these areas, and also safeguard local natural livelihoods and the culture of the indigenous Sámi.

These wilderness reserves together account for almost half of the total extent of Finland's established network of protected areas. Ten of these reserves are located within the official Sámi Homeland region. Reindeer herding is considered to be the mainstay of Sámi culture, and the wilderness reserves support the preservation of this culture by providing extensive unfragmented grazing grounds, which could otherwise be threatened by logging or other land use pressures. The reserves contain traces of their long history of natural resource use, various old structures and the remains of settlements, all of which the Wilderness Act also protects. Local people practising traditional livelihoods are permitted to set up temporary camps in wilderness reserves to support their activities, and thus continue traditional practices related to the use of the natural environment.

Since more than 70% of the Sámi Homeland consists of areas protected to varying degrees, traditional uses of natural resources must be allowed to also continue in these areas according to the principles of the UN Convention on Biodiversity. In the Kaldoaivi reindeer herding district, for instance, reindeer graze almost entirely in protected areas. From the perspective of reindeer herding and Sámi culture the large national parks of Northern Lapland and many of the region's strict nature reserves are regarded as wilderness areas in the same way as the actual wilderness reserves. Reindeer grazing is prohibited only in the Malla Strict Nature Reserve.

The recent international evaluation of management effectiveness in Finland's protected areas credited Metsähallitus for its use of dialogues in developing the management and use of protected areas in Northern Finland. Cooperation with



The Kevo canyon in winter. The Kevo Strict Nature Reserve is an important area for scientific research and instruction, as Turku University's Kevo Research Station is situated adjacent to the park. The plants and animals of the nature reserve have been studied since the 1950s. Photo: Matti Mela.

reindeer herders' district associations and the Sámi Parliament has been continuous and frequent. In spite of related conflicts, it has been possible to build a consensual understanding during 2005-2006 on land use solutions for the natural resource plans for Lapland, for instance. Management planning has not yet begun for a third of the wilderness reserves, but cooperation between different stakeholders has been intensified during the drafting of existing management plans.

Research stations benefit from strict nature reserves

One important objective of protected areas, and especially strict nature reserves, is to provide representative samples of undisturbed natural environments for research purposes. Such areas can be used for comparative studies focusing on the impacts of environmental pressures in areas subject to economic exploitation.

A lot of research has been conducted in protected areas in southernmost and northernmost regions of Finland, in particular. Protected areas that have been the focus of intensive research in-

clude the national parks of Nuuksio, Patvinsuo, Urho Kekkonen and Pallas-Ounastunturi (now known as Pallas-Yllästunturi). Most research has been conducted at field stations run by universities and research institutes with facilities in or near the larger national parks or strict nature reserves, such as Seili in the Archipelago, Tvärminne in the Ekenäs Archipelago and at Oulanka, Värriö and Kevo. University research stations also use national parks and strict nature reserves for teaching purposes.

Five nature reserves in the borderlands of NE Finland together form the Friendship Park, which was founded in 1990, and is administered and managed by Metsähallitus. Finland's Friendship Park and Russia's Kostomuksha Strict Nature Reserve together form the transboundary Friendship Nature Reserve. Research work on both sides of the border is coordinated in Finland by the Friendship Park Research Centre, which is run as part of the Kainuu Regional Environment Centre. The work done in Kostomuksha Strict Nature Reserve is administered in Russia by a unit of the Russian Federal Government. These parks give researchers opportunities to study

areas that originally consisted of similar natural forests, but have been used in different ways on either side of the Finnish-Russian border, which has been in the same place for more than 400 years. The research is of considerable international interest.

The 40-kilometre-long canyon that runs through Kevo Strict Nature Reserve contains some of the most significant and diverse habitats for threatened plants in Northern Lapland. A systematic survey of the area's vegetation was begun already in 1954. NHS Lapland has now compiled an extensive review of research and reports relating to nature and its uses in Paistunturi Wilderness Reserve, and Kevo Strict Nature Reserve, which lies as an incave within the wilderness reserve. The review was used in the drafting of a management plan for the whole area.

The research areas of the Finnish Forest Research Institute (Metla) include several strict nature reserves and other protected areas. The Kilpisjärvi research area, for instance, encompasses Malla Strict Nature Reserve, Saana Nature Reserve and Saana Herb-rich Forest Reserve. Malla and Saana are both known for their rich

fell vegetation and the occurrence of many species of plants and butterflies that are rare in Finland as a whole. Studies conducted in the research area have examined subjects including threatened plants and the impacts of reindeer herding on fell ecosystems. The Vesijako research area in the Lake District of Southern Finland includes Vesijako Strict Nature Reserve, where changes in natural tree stands are monitored, and their species communities are studied. Metla's research areas and nature reserves will be transferred to Metsähallitus in 2008.

National hiking areas focus on outdoor activities

National hiking areas are quite extensive areas established under the Outdoor Recreation Act. Their primary objective is to provide opportunities for hiking and other forms of outdoor recreation. The NHS has regularly tallied the numbers of visits to these hiking areas, and visitor surveys in all the areas have been conducted since 2000. The seven areas together attract some 350,000-360,000 visits every year. The largest visitor



Braving the rapids in the Ruunaa Hiking Area. The rapids along the River Lieksa offer many opportunities for pastimes from canoeing to fishing. The river was once an important waterway for log floating and for trade between Finland and Russian Karelia. An EU-funded Interreg project in 2003-2006 aimed to utilise this historical heritage to enhance nature tourism along this whole stretch of the river. Photo: Jorma Peiponen.

numbers are in Ruunaa – almost 120,000. Other areas have been visited 25,000-60,000 times a year. All the national hiking areas have many facilities for visitors, and provide plenty of opportunities for recreational activities. However, they also have natural and cultural values that can be used to attract new visitors.

All of the national hiking areas belong to the Natura 2000 network. They contain many valuable forest, mire and shore habitats and their characteristic species. They significantly add to the ecological network in Southern Finland. The hiking areas of Ruunaa and Hossa, for instance, combine with neighbouring nature reserves to form extensive interlinked networks of protected areas which have a significant regional role in preserving biodiversity. The similar network around the Evo Hiking Area is described in Information Box 17 on p. 160.

The management plans for hiking areas were drafted a few years ago. In the plans, areas are divided into several land use zones. Forestry measures are not permitted in designated areas of old-growth forest, but may be used elsewhere in hiking areas. In “park” zones landscape and recreational values are prioritised. Hunting, fishing and reindeer herding are permitted within limits defined by areas’ Natura values. Habitat restoration measures are being planned for some sites formerly used for commercial forestry.

Many hiking areas have interesting histories of their own. Ancient rock paintings in Hossa depict prehistoric hunting practices. Other historic features in hiking areas include log-floating structures along the River Lieksa in Ruunaa, old ironworks at Teijo, and Finland’s first forestry school at Evo. Highlighting features related to earlier uses of forests, local history and culture can bring new visitors to hiking areas in addition to active hikers and outdoor activists. One such project at Ruunaa, which benefits from long-term EU-funding, aims to increasingly draw on the local history of this riverside area to boost tourism.

9.1.3 Maintaining the Favourable Statuses of Species and Habitats

The most important function of nature reserves is to preserve the whole spectrum of species and biotopes found in Finland for future generations. In the context of the Natura 2000 network their

special purpose is to preserve Finnish examples of species and biotopes that have become scarce in Europe or even globally. The current statuses of threatened species and habitats were examined in Section 5.1.3. The proportions of species considered as threatened in different species groups and habitats vary between 7% and 14% (see Figs. 17 and 18, p. 64). The largest numbers of threatened species are found in insect and fungus species groups, while in proportional terms the numbers of threatened species are highest for forest and agricultural environments. The most threatened habitat types are smaller-scale seashore habitats, arctic fell habitats and cultural environments.

Successes in conservation have to be assessed with regard to:

- trends in the current statuses of species (favourable conservation status)
- the restoration or maintenance of habitats’ original states (through active measures)
- the prevention of pressures threatening species and affecting their habitats.

The international evaluation in 2004 gave Metsähallitus a good overall rating on the preservation of biodiversity. Cooperation on a wide front is helping to promote species conservation. Particular attention has been given to species for whose conservation Metsähallitus officially has special responsibility. With a few exceptions, it has been possible to ensure that the statuses of these species remain satisfactory, at least on State lands.

Statuses of special responsibility species stable or improving

A scientific evaluation of Finland’s Natura 2000 proposals conducted in 2000, and an assessment carried out for the purposes of the national biodiversity action plan both showed that the overall conservation status of species listed in EU directives is quite favourable in Finland, although the conservation degrees and statuses of individual species vary considerably (see Information Box 8, p. 66). The conservation statuses of Directive species is being re-evaluated in 2007 in connection with reporting on Finland’s implementation of the Habitats Directive during the period 2001-2006.

In 2005 Metsähallitus had national responsibility for 24 species whose occurrences are all or mainly on State lands, including 4 birds, 2 mammals and 18 vascular plants. Trends in these species' populations are monitored continuously, with conservation measures implemented as far as the available resources allow. Considerable proportions of the occurrences of most of these species are safeguarded within protected areas. In 2006 Metsähallitus was given responsibility for 13 more species, including some insects and mosses. The conservation statuses of all 37 species and the need for related conservation measures are being evaluated during 2007.

Of the known occurrences of the vascular plant species, for which Metsähallitus has special responsibility, about 70% are in protected sites, and about 75% are in lands administered by Metsähallitus (see Table 38). Work has focused on developing effective monitoring methods and the compilation of data on their occurrences.

Some species require continuous management, and suitable measures have been initiated at several occurrences. The conservation of yellow marsh saxifrage (*Saxifraga hirculus*) has been significantly promoted through an EU LIFE project (see Information Box 24).

Data on the six vertebrate species for which Metsähallitus has national responsibility is maintained in separate data banks. The situation for almost all of these species is at least stable, but in spite of all efforts there are still worries about the future of a few species.

Numbers of the endangered **Saimaa ringed seal** (*Phoca hispida saimensis*) have generally been increasing by a couple of percent a year for the last decade, thanks to agreements made to limit certain forms of fishing within the seals' breeding areas. Their population today numbers about 280, and the aim is that it should increase to 400 by 2020.

Table 38. Conservation degrees of registered occurrences of vascular plant species for which Metsähallitus had national responsibility in 2005. Observation data on all such species except threatened raptors and a few other species is stored in the environmental administration's Hertta databank. Source: Finnish Environment Institute and Metsähallitus.

Species	Registered occurrences	Conservation degree	Proportion on Metsähallitus land	Possible occurrences to be confirmed
<i>Arnica angustifolia</i>	58	91%	90%	11
<i>Draba cinerea</i>	33	91%	85%	13
<i>Sedum villosum</i>	2	50%	100%	
<i>Arctagrostis latifolia</i>	7	86%	100%	2
<i>Trisetum subalpestre</i>	22	27%	100%	14
<i>Saxifraga hirculus</i>	727	67%	71%	479
<i>Potentilla anglica</i>	23	65%	52%	41
<i>Polygonum oxyspermum</i>	5	100%	80%	8
<i>Elymus farctus</i>	6	83%	100%	1
<i>Crepis tectorum</i> ssp. <i>nigrescens</i>	3	100%	100%	
<i>Artemisia campestris</i> ssp. <i>bottnica</i>	2	50%	50%	7
<i>Botrychium simplex</i>	8	75%	13%	19
<i>Silene involucreta</i> ssp. <i>tenella</i>	2	100%	100%	
<i>Epipactis atrorubens</i>	53	92%	92%	16
<i>Carex holostoma</i>	75	57%	79%	22
<i>Arenaria pseudofrigida</i>	39	87%	69%	5
<i>Dryopteris fragrans</i>	36	92%	100%	9
<i>Melica ciliata</i>	2	100%	100%	
Total 18 species	1 103	71%	75%	647

The critically endangered **arctic fox** (*Alopex lagopus*) is not thought to have bred in Finland for many years, although individual animals are sighted about ten times a year on average. As the variations in the populations of small rodents have lessened, the red fox has started to compete with the arctic fox ever higher up on the fells, and take over its former dens. The arctic fox struggles to compete with the red fox in northernmost Finland, which lies on the edge of its range, since it typically lives near and above the tree line. Metsähallitus is involved with other Nordic countries in the Arctic Fox LIFE project, which was launched in 2003, and is led by University of Stockholm. As part of this project about 200 old arctic fox dens are visited twice a year, and red foxes are exterminated from arctic fox breeding areas through intensive hunting.

Numbers of **golden eagle** (*Aquila chrysaetos*), a species classed as vulnerable in Finland, have been gradually rising. Some 400-430 pairs live in Finland, of which about 90% live in lands administered by Metsähallitus, and 40% in protected areas. Metsähallitus is responsible for the national monitoring of golden eagles and their territories, which form the basis for the compensation of damages to reindeer herders. Metsähallitus also participates in other golden eagle conservation work together with other environmental authorities. The greatest threat to the eagles is various kinds of disturbance to their nesting sites. Nests and their surroundings are considered in all land uses, and are spared. A special conservation plan for the golden eagle was drawn up in 1994, and will be updated during 2007-2008. Advances in golden eagle conservation are described in more detail in Information Box 25.

The endangered **gyrfalcon** (*Falco rusticolus*) breeds in northernmost Lapland, where the species numbers only 15-40 pairs. Measures are taken to prevent the disturbance of their nests through intense surveillance, surveys and the relocation of routes and events away from their nesting sites. The endangered **peregrine falcon** (*Falco peregrinus*) has a Finnish population of 200-220 pairs, of which 90% live in Metsähallitus lands and 65% in protected areas. The species' population has gradually recovered from a collapse caused by toxic chemicals in the environment. Nesting sites have been safeguarded by establishing protected areas and through land use planning solutions.

The prospects for the critically endangered **white-backed woodpecker** (*Dendrocopos leucotos*), which lives in old deciduous forests in Southern Finland, have improved significantly over the last decade. Known woodpecker habitats have been surveyed and restored, and further areas of suitable habitat placed under protection. The species' population currently numbers about 65-70 breeding pairs.

In addition to these species for which Metsähallitus is responsible nationally, Metsähallitus also plays an important role in the conservation of other threatened species. The vulnerable **white-tailed eagle** (*Haliaeetus albicilla*) has a Finnish population of some 250 pairs, including 40-50 pairs in the provinces of Lapland and Oulu, where Metsähallitus is responsible for its conservation. In these provinces 75% of the species' nests are in Metsähallitus lands, and 25% in protected areas. Disturbances around nesting sites are the most serious threat also to white-tailed eagles. Nesting sites are considered in all land use planning in Metsähallitus lands in Northern Finland, and spared from logging. New nesting sites are continuously being sought. A conservation plan for Lapland's white-tailed eagles was completed in 2001, and is regularly updated. The species' Finnish population is on the rise, but the rate of increase is higher in the south than in the north.

The critically endangered **lesser white-fronted goose** (*Anser erythropus*) has not been observed breeding in Finland since the mid 1990s. The main threats to the species and the reasons for its decline lie outside Finland in the birds' wintering areas and along migration routes. These were surveyed through an EU LIFE project led by Metsähallitus (1996-2000), applying satellite tracking and other methods. Steps have been taken to prevent the hunting of lesser white-fronted geese in their wintering areas through agreements, and to safeguard the birds in all their migratory staging areas in Europe. In Finland foxes have been exterminated in possible nesting areas, and hunters have been trained on their identification. Metsähallitus is also involved in a follow-up EU LIFE project (2005-2008), which aims to further all aspects of the species' conservation.

The vulnerable **freshwater pearl mussel** (*Margaritifera margaritifera*), which used to be

Golden Eagles on the Rise in the North

Golden eagles (*Aquila chrysaetos*) were once distributed throughout Finland, but by the mid 1800s they had disappeared from the south coast, and later they vanished from most of southern and central Finland. Their numbers declined until the 1970s, when little more than a hundred pairs were found in Finland. This decline was caused by persecution, and by increased disturbance due to people settling in the birds' nesting areas. The intensification of forestry and other land uses also meant there were fewer suitable areas. The golden eagle was first protected in 1962, but in the reindeer husbandry region it was still possible to kill them under exceptional permits until 1968.

Golden eagle numbers in Finland have increased slowly since the population became protected, thanks especially to more effective supervision, and by 2005 as many as 416 golden eagle pairs were counted in Finland. Forestry guidelines stress the importance of sparing nesting environments, and eagle nests are also taken into account in other land uses. Today 40% of

Finland's known golden eagle territories are in protected areas.

Metsähallitus is responsible for national monitoring of the golden eagle. All known territories (more than 400) are checked yearly. Nests in trees (almost 850) are also monitored. Much of this work is carried out by volunteers, whose work contribution approximates to one man-year. Metsähallitus staff use more than two man-years in total for this monitoring.

About 90% of known golden eagle territories are located in the reindeer husbandry region. Golden eagles often prey on reindeer calves, and may also occasionally kill adult reindeer. The proportion of reindeer meat in their diet varies between areas and from year to year. Since 1998 reindeer herders have been compensated for losses according to the number of occupied golden eagle territories producing young in their herding district. In 2005, such compensation amounted to 370,000 euros. Since the new compensation system came into force, more than a hundred new golden eagle nests have been found, thanks to information from reindeer herders.



Inspecting the nest of a golden eagle (*Aquila chrysaetos*). Over 400 known golden eagle territories are inspected annually. Volunteer ornithologists make a significant contribution to this laborious task. Photo: Olli-Pekka Karlin.

widespread through Finland's inland waters, now only survives in a few rivers in Northern Finland. This mollusc species is threatened by the drainage of forests and mires, changes in water quality and volumes, and hydrological engineering along rivers. During their larval stage these mussels are parasitically dependent on their salmon hosts, but salmon have declined or disappeared in many rivers. Metsähallitus has surveyed the states of occurrences of freshwater pearl mussel particularly in northernmost Lapland in collaboration with other experts.

Habitat conservation concentrated on forests and mires

About half of Finland's terrestrial environments consist of forest habitats on mineral soils, and a third are mires or peatlands of various types. More than a third of the country's threatened species are associated with forests, and 5% are mire species. These factors make it natural to focus habitat conservation efforts on such environments. This is reflected in both the proportions of protected habitat types in protected areas, and the management measures carried out to maintain biodiversity. The METSO Programme in particular has in recent years directed conservation efforts towards wooded environments.

Some biotopes classed by the EU as being of special importance, including raised bogs, aapa mires, wooded mires and natural boreal forests are abundant in Finland's protected areas. Biotope surveys for the METSO Programme revealed more than 50,000 hectares of natural boreal forest around Southern Finland. This area corresponds to more than a quarter of the forest lands within the region's protected areas. This figure is significant when compared, for instance, to the total area of the old-growth forest reserves established in Southern Finland (about 10,000 ha). Certain other important biotopes, such as coastal dunes, various meadowland biotopes and broad-leaved woodlands are scarce in Finland in general, and also consequently within protected areas. Valuable traditional agricultural biotopes, bird wetlands and smaller water bodies are managed only to a very limited extent, in relation to their total area, in comparison to many other European countries.

On the basis of threatened species evaluations, it has been possible to focus conservation and management measures on the habitat types associated with the most significant proportions of Finland's threatened species, namely herb-rich and heath forests, rich fens and spruce mires, areas with lime-rich rock types, springs, sandy shores and shore meadows, dry meadows, and wooded traditional agricultural biotopes. In recent years more attention has also been given to the scarce open sunny and dry habitats (for example, sandy and shingle beaches, dunes, south and southwest slopes of eskers), which have their own characteristic species communities. Important habitats for rare and threatened species are also widely found outside protected areas, including State-owned commercially managed forests.

Occurrences of threatened species in Metsähallitus's commercially managed forests have mainly been delimited on the basis of field surveys conducted for the purposes of landscape ecological planning. Habitats of species requiring special protection have been delimited in old-growth forests and other heath forests in about 1,100 sites with a total area of 1,600 ha. Habitats of other species threatened at national level have been delimited at more than 3,400 sites with a total area of some 6,500 ha.

The conservation of threatened species is most effective when it concentrates on habitats that host many such species. Figure 58 shows the proportions of all threatened forest species associated with each of the different forest habitat types, together with these habitat types' respective proportions of the ecological sites defined within Metsähallitus's commercially managed forests, in terms of both area and timber volume. The proportions of defined ecological sites consisting of herb-rich forest and wooded traditional agricultural biotopes seem small compared to the numbers of threatened species found in these habitats. But such habitats are so scarce in State lands that there is practically no scope for their further protection. The same is largely true for esker forests and burnt heathland forests.

Pine mires and spruce mires account for a larger proportion of the ecological sites. In both cases their proportional significance is greater in terms of area than timber volume, as such sites have fewer trees than most forest types. The

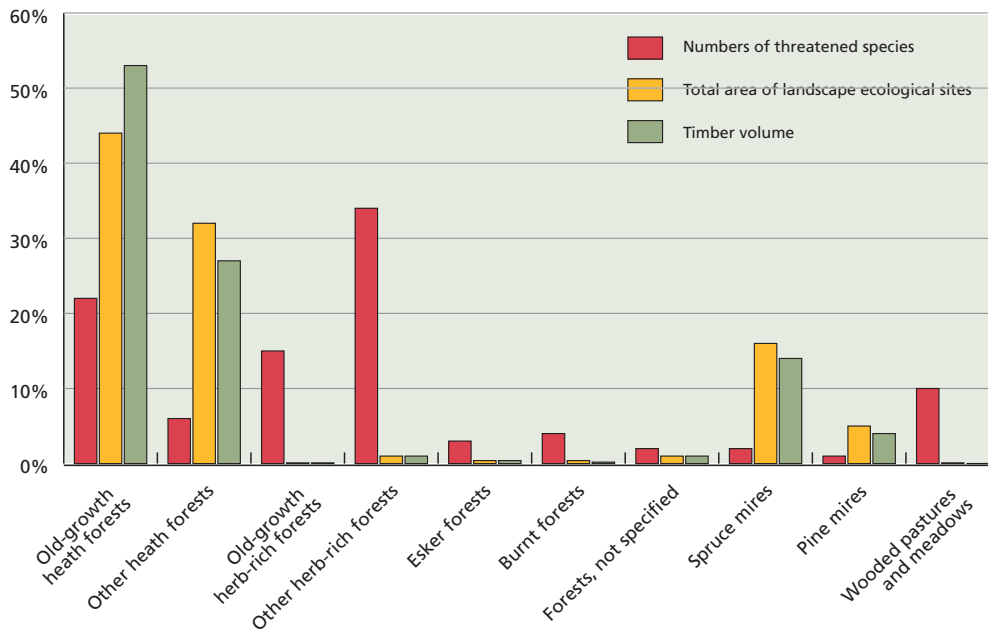


Figure 58. Proportions of threatened species, landscape ecological sites and timber by volume found in different habitats within Metsähallitus's commercially managed forests. Source: Metsähallitus.

importance of the trees in such areas for their threatened species may be relatively low, whereas their hydrological conditions are much more important to maintain or restore. To improve the conservation of pine mires and spruce mires, more efforts must be directed to drained mires. Such measures can be most effectively concentrated in areas, where wooded mires in commercially managed forests form part of larger hydrological entities that also include mires within protected areas, where restoration is also needed.

Of all the ecological sites defined in Metsähallitus's commercially managed forests, heath forest habitats account for 77% in terms of area and 80% by total timber volume. The amounts of wood are important for the threatened species of heath forests, most of which are insects and fungi. The structural features of tree stands are of prime importance for these species. It is no longer possible in practice to protect new areas of suitable habitat for species associated with old-growth heath forests through conventional conservation procedures, so new means must be used to improve their conservation.

Monitoring the impacts of habitat restoration and management

It is fundamentally assumed that habitat restoration will improve the quality of protected areas. However, there is a lack of information about the impacts and effectiveness of most restoration methods, with the exception of controlled burnings. Metsähallitus has carried out extensive habitat restoration work in protected areas during the 2000s, particularly with funding from the METSO Programme. Since such work is expensive, its cost-effectiveness and impacts must be monitored, and measures then be redirected according to the principles of adaptive management. Monitoring methods have been developed alongside habitat restoration measures, often through collaboration in projects run by the Finnish Environment Institute and the Finnish Forest Research Institute.

Metsähallitus assesses how well the objectives of restoration work are achieved through standardised monitoring methods applied in different parts of Finland. A geographic information system is used in the monitoring of the implementation of measures. Management monitoring is conducted for all restored mires, to ensure that measures are technically successful, with mires monitored 1, 2, 5 and 10 years after restora-

tion work. Monitoring is also conducted in sites where habitats are managed, to help ensure that measures duly improve the structures of biotopes, the recovery of species, the characteristics of soils and trends into the future, and also that they inhibit undesirable trends.

A network of experimental sites, set up in forests dominated by spruce and pine, is being used to help monitor changes in tree stands that occur as a result of restoration work involving the creation of small clearings or increased quantities of decaying wood. At clearing sites special attention is paid to the subsequent growth of deciduous trees and new seedlings in the clearings. In sites where measures are taken to create more decaying wood, the consequent changes in species communities are monitored, as well as quantities of decaying wood. Trials involving the trapping of beetles were initiated in spring 2006 in such restoration sites, and also in unrestored sites for comparative purposes. Monitoring of polypore fungi will begin later. Special experimental sites have been set up for comparative purposes for each type of restoration method. This helps to ensure that any observed changes are truly consequences of the habitat restoration measures. A monitoring network is also being planned to

help assess the ecological impacts of mire habitat restoration and management measures, covering the main mire types (spruce mires, pine mires, open bogs) and the most widely restored mire habitat types within these broader categories.

In collaboration with University of Jyväskylä research into the ecological sustainability of mire habitat restoration work is being conducted as part of wider research assessing the impacts of restoration. Restoration work has been done on previously drained mires in Seitsemien National Park since 1987. Trends in the vegetation communities of natural and restored mires have also been studied in the park. Such research shows that restoration can successfully trigger trends that will probably help mire ecosystems to revert towards their natural state. The changes that occur in forest and mire ecosystems after restoration work are often quite slow. More extensive evaluations of the results of monitoring will only be feasible after many years.

Environmental pressures under control

Evaluations of the threatened statuses of biotopes and species particularly look at human impacts and the related factors threatening current oc-



Beetle surveys form part of the impact monitoring of ecological restoration. This window trap has been set up in a burnt forest site in Patvinsuo National Park. Photo: Petri Martikainen.

currences. The statuses of biotopes are assessed on the basis of quantitative reductions and qualitative deterioration in threatened and rare biotopes. The statuses of species are evaluated on the basis of their population sizes, the extents of their distributions, the sizes and quality of their occurrences, and projected trends in these factors.

The main reasons for the loss and decline of species include the overgrowth of cultural and traditional agricultural landscapes after they are no longer actively used, and various factors related to modern forestry practices that have changed the structures of tree stands and reduced the quantities of decaying wood in forests. These trends have most seriously affected insects, mosses, polypores and other fungi. Another factor threatening invertebrate animals has been construction. Vertebrates have also declined due to trapping, collection and disturbance, as well as changes in their habitats.

Habitat restoration and management in areas used for farming and forestry and the rehabilitation of wetlands and small water bodies are important ways to preserve the structural features of threatened species' habitats and improve their quality. Fewer possible concrete actions have been feasible to improve water quality and enhance ecological conditions in inland waters and marine environments. Steps are being taken to counter the threats that face the Gulf of Finland due to rapidly increasing oil transportation, including improvements in oil pollution prevention capacity and enhanced cooperation between the various authorities involved. The threats and pressures facing habitats and measures to prevent or reduce them are listed in Table 15, p. 140.

The construction of routes and structures for recreational uses is carefully planned, and visitors are channelled within protected areas and their vicinities on the basis of the most recent and complete data available on the occurrences of threatened species. This is mainly done through management plans, guidance and supervision. The habitats of threatened and vulnerable mammal and bird species are actively managed. Metsähallitus also collaborates with local businesses and groups (including professional fishers, reindeer herders, tourism operators and hunters) to ensure that these species are duly considered in all local activities.

9.1.4 Ecological Impacts of Recreation at Sustainable Levels

Everyone in Finland should have a chance to see and experience the country's natural environments in safety and undisturbed, either independently or with guidance. Such opportunities are widely available in national parks and other protected areas. Visitors are attracted to these areas through the provision of good facilities and opportunities for recreational activities. High visitor numbers are not in themselves the ultimate goal, however. The main aim is to promote learning and attitudes that value nature. In the planning of the nature interpretation provided for visitors, the conservation benefits of such activities must be weighed against the possible harm that can be caused by visitors to protected areas, aiming to find the best overall balance.

The Government has particularly emphasised in the VILMAT Action Plan that targets set for increases in visitor numbers must not endanger objectives related to the conservation and sustainable use of protected areas. It is therefore important that visitor numbers and the impacts of recreational use can be reliably monitored, enabling changes to be made in management planning and visitor direction on the basis of monitoring results.

To help evaluate the sustainability of nature tourism, the NHS has introduced a system for measuring and evaluating the impacts of nature tourism, which will serve as a tool for management planning alongside the guiding principles defined for sustainable tourism in protected areas. The system will cover ecological impacts, as well as social and economic impacts. Performance measures will be selected to cover all aspects of sustainability and the key objectives defined for each area. These measures must still be further developed.

On the basis of a review of related literature, an approach that focuses on *Limits of Acceptable Change (LAC)* was chosen to form the basis of the future development of such performance measures. This approach is very suitable in the context of sustainability, since it stresses that limits must be set through decision-making, and are not absolute truths. The LAC represents a practical tool to help monitor changes in the state of protected areas and identify suitable actions to

Monitoring the Environmental Impacts of Nature Tourism in Syöte

The Syöte National Park, the Iso-Syöte Hiking Area and the Syöte recreational forest, which are located close to each other, form an important part of the Syöte tourism area. Since the national park was established in 2000, nature tourism in the area has increased, and the aim is to promote tourism further. At the same time, it is desirable to ensure that all such development is sustainable, and gives due consideration to the area's natural features, the local community, and tourists. A plan for the monitoring of environmental impacts of nature tourism in the Syöte area was approved and introduced in autumn 2006. The bases for the monitoring were Metsähallitus's principles of sustainable nature tourism, whose implementation is being evaluated in Syöte using various indicators.

In monitoring the environmental impacts of nature tourism, Metsähallitus uses the Limits of Acceptable Change (LAC) method. The idea of the LAC method is to define limiting values for indicators measuring the environmental effects of tourism. The limiting values may be the highest or lowest acceptable values, depending on the indicator. If limits are exceeded, it becomes

necessary to carry out previously planned actions to improve the situation. The strength, and at the same time the challenge, of the LAC method is in defining the limits, on the basis of decisions made concerning acceptable impacts.

Indicators measuring sustainability should be as reliable as possible, reasonably easy to use, and sensitive enough to potential changes. At Syöte, a total of 31 indicators have been selected. Most of them are accordant with Metsähallitus guidelines, and it is hoped that such indicators will be adopted in all areas important to tourism. The indicators used at Syöte also include parameters that take into account the special features of the area. At least one indicator has been selected for each of the principles of sustainable nature tourism and the related goals. Visitor surveys, which are carried out regularly at Syöte, have an essential role in monitoring environmental impacts, as a third of the indicators concern visitors' opinions. Several indicators focus on trail erosion, including the average width of trails. Any increase in average trail width indicates a negative ecological impact of nature tourism.

Examples of indicators of the environmental impacts of nature tourism used in the Syöte National Park. Source: Metsähallitus.

Principle	Goal	Measure	Present value	Limit value	Response
Improved recreational facilities are provided for visitors	Quality and amenity value of the recreational environment is maintained	Customer satisfaction index	4.28 (scale 1-5)	3.8	Analysis of causes, improved reaction to feedback
The environment is subjected to as little pressure as possible	Terrain erosion remains within set limits	Mean width of eroded terrain along trails	Value in 2006	20% increase	Trail restoration, redirection of visitors
Local traditions and cultures are respected	Nature tourism products are of high quality and based on local traditions	Number of heritage-based nature tourism products	2	2	Enhancement of opportunities for and cooperation with local firms

mitigate unfavourable changes. Information Box 26 presents some of the performance measures used in Syöte National Park.

The idea behind the monitoring of the impacts of nature tourism is to define target states for areas, compare these to their current state, and find ways to reach and maintain the desired states. Considering the limits of acceptable change during the planning process helps to highlight trends threatening the state of an area, and to identify ways to curb such threats. In developing monitoring methods and management planning it has also been possible to exploit research findings, such as the results of research into trail erosion in the national parks of Oulanka and Pallas-Yllästunturi (see Information Box 14, p. 132).

9.2 Socio-economic Impacts

Although the primary role of protected areas is to maintain biodiversity, they must also meet many other needs and expectations, especially in Northern Finland. Suitable conditions for reindeer herding and other traditional livelihoods

must continue to be safeguarded in spite of the increasing importance of providing opportunities for recreation and promoting nature tourism so as to increase employment. The long-established tradition of everyman's right to benefit from the natural environment in Finland is possible to uphold by sustainably harmonising the multiple uses of protected areas in the contemporary context.

In Southern Finland, protected areas and their surroundings are associated with different kinds of pressures and objectives related to their use. The challenge of preserving diverse cultural heritage is closely interwoven with the need to preserve natural values, and the future of both types of heritage in remote regions may depend on the potential income that could be derived from nature tourism in protected areas. In the context of land use, the conservation of natural and cultural environments often faces competition from the economic benefits that can be obtained through forestry and farming. The conservation of certain species can also lead to conflicts with local livelihoods in some contexts.



Thousands of cubic metres of firewood are used annually at serviced campfire sites, huts and cabins. The provision and burning of this wood has many environmental impacts. The maintenance of service sites consumes energy and erodes terrain, even though transportation is concentrated to the winter months when the ground is snow-covered. Firewood consumption rates are monitored and visitors are urged to minimise their use of firewood. Photo: Pia Arvola.

Growing emphasis is placed on socio-economic research. Such research can improve our understanding of the social impacts of nature conservation and natural resource use in different contexts, while also clarifying the benefits that can be obtained through the sustainable management and use of protected areas with multiple objectives.

9.2.1 Protected Areas Support National Land Use Objectives

Finland's national land use objectives form part of the planning system defined in the Land Use and Building Act. One important objective is the use of planning measures to help preserve biodiversity and cultural heritage. These objectives have been defined with regard to the international agreements mentioned in the beginning of this report. Objectives include the creation and preservation of ecological links between protected areas, and the promotion of nature recreation and cultural tourism through the development of tourism areas as networked concentrations of services. This requires the harmonisation of tourism, recreational activities and other land uses.

The SW Archipelago, the land uplift coasts of Western Finland, the Saimaa Lake System and the fells of Lapland are named within the national land use objectives as four special regional entities whose natural and cultural environments must be preserved so that suitable conditions for the continued settlement and economic use of these areas are also preserved. The preservation of the characteristic villages and cultural environments of these regions, which are adapted to local natural conditions, is indeed a precondition for the survival of their valuable cultural biotopes.

Section 8.5.3 explained the role played by Metsähallitus and protected areas in the maintenance of suitable conditions for local cultures. A lot of work has been done in the Archipelago National Park to preserve traditional cultural landscapes and grazing practices. The land uplift coasts of the Kvarken Archipelago have now been granted world heritage site status. In the Saimaa Lake System the national parks of Linnansaari and Kolovesi have been expanded. Likewise the two oldest national parks in Fell Lapland have been greatly expanded, and management plans have now been drawn up for the newly reestablished

parks of Pallas-Yllästunturi and Pyhä-Luosto. In all of these regions special attention has been paid to both the preservation of cultural heritage and the development of nature tourism.

9.2.2 Conflicts Between Conservation and Local Livelihoods

In recent years there has been widespread public debate on issues concerning conflicts between species conservation and local livelihoods. Examples are the vociferous demands of coastal fishers to limit the populations of seals, and of sheep farmers in Eastern Finland and reindeer herders in the north to limit populations of wolves, which they believe have been allowed to recover to excessive levels. The economic losses suffered by individual entrepreneurs must be balanced with the need to conserve scarce mammals requiring large territories. There is a need for both careful consideration of how these species' populations should be managed, based on reliable data, and satisfactory solutions to compensate for losses.

Seal protection angers Baltic fishers

The numbers of grey seals (*Halichoerus grypus*) in Finnish marine areas have risen steeply in recent years, with the annual rate of increase averaging 10% during the 2000s. In 2000, around 3,000 grey seals were counted in Finnish waters, and by 2005 they numbered over 8,000. There were estimated to be approximately 18,300 grey seals in the whole of the Baltic Sea in 2005, of which some 45% live in Finnish waters. The Baltic ringed seal (*Phoca hispida botnica*) population has not grown so rapidly, but their numbers are thought to have risen by around 5% a year in the Bothnian Bay, where some 75% of the Baltic's ringed seals live.

In 2001, seven seal reserves were established in State-owned marine waters, in areas that include some of the most important island seal colonies on the Finnish coast. According to aerial surveys, 15–40% of all observed grey seals in Finland live within these reserves each year. Almost all of the Gulf of Finland's grey seals (80–90% of observations) seem to be found in the reserves, which represent undisturbed refuges, especially during the moulting season.



Grey seals (*Halichoerus grypus*) basking on rocks in the Gulf of Finland. Research has shown that the establishment of seal reserves in 2001 and the subsequent fishing restrictions have had a direct effect on only a few professional fishermen, although many believe that the reserves have indirect effects on fishing conditions in surrounding waters. Photo: Antti Below.

Important areas for the conservation of Baltic ringed seals include Perämeri National Park, parts of Archipelago National Park, and also potentially Eastern Gulf of Finland National Park, where seals lived (and were hunted) as recently as the 1980s. Seal hunting is prohibited in protected areas, where fishing is also restricted to differing degrees. The Helsinki Commission (HELCOM) has started to assess the significance of Baltic Sea Protected Areas for seals.

The increase and spread of seal populations through almost the whole of the northern Baltic has also led to problems. Losses caused to fisheries and fish farms in terms of reduced catches and damaged equipment have increased rapidly, as have consequent calls for the limiting of seal populations. Both seal species cause damage, but grey seals are involved to a much greater extent. Largely due to these problems, the hunting of grey seals became permissible again in 1998 – after a ban lasting 16 years.

Fisheries' representatives are also calling for the growth of ringed seal populations to be checked, especially in the Bothnian Bay. Seal populations are not, however, limited by national

boundaries, so international perspectives must also be considered in their management. It is hard to find positions that can be universally approved in the face of conflicting demands at national and international levels.

The main objectives of the seal management plan, drafted by the Finland's Ministry of Agriculture and Forestry, are to keep seal populations viable, to reduce the losses caused by seals to commercial fishing and fish farms, and to provide a wide range of reliable public information. The plan emphasises the view that grey seals should be seen as a sustainably exploitable natural resource. This means that their numbers could be limited, even quite drastically, according to the harm caused by the seals.

Seal hunting is permissible under the EU Habitats Directive and Finland's Hunting Act. But according to legislation, seals may only be hunted in ecologically sustainable ways that do not endanger their favourable conservation status. Ecological sustainability must therefore be ensured with regard to the seals' population sizes and reproduction and mortality rates.

It has been proposed that Finland's marine waters should be divided into three areas for the purposes of managing seal populations: the Gulf of Bothnia-Kvarken, SW Finland and the Gulf of Finland. This would facilitate the consideration of local conditions and livelihoods. According to the management plan, hunting permits may be issued within each management area, whenever seal numbers in an area exceed levels defined in criteria for minimum viable populations.

Debate on means to resolve the seal conflicts in the Baltic area continue, as the seal management plan is still under discussion. Nature conservationists fear that allowing exploitation of the seal populations will again bring them down dangerously.

Agreements reached with fishers to benefit Saimaa ringed seals

Cooperation with fishers in Eastern Finland on the conservation of the endangered Saimaa ringed seal has already borne fruit. The total Saimaa ringed seal population is now estimated to number 270-280, having risen by about 90 over the last decade. Metsähallitus surveys the seals' breeding sites annually, and estimates overall birth rates and mortality rates. Forecasts indicate that the seals will only survive in protected areas.

About 30% of all Saimaa ringed seals breed in waters within the national parks of Kolovesi and Linnansaari, and almost 70% breed in dens built in snowdrifts along shores on State lands. Natura sites cover around 90% of their breeding areas. To prevent disturbance during the breeding season, access to the shores where seals breed within national parks is prohibited during the winter, and similar restrictions are being drafted for Natura sites where the seals live.

The types of fishing tackle most dangerous to the seals, including strong nets and baited hooks, are prohibited in Natura waters in Lake Saimaa. To protect seal pups during their weaning phase, Metsähallitus has agreed with local fishing associations that nets may not be used during the early summer in the seals' main breeding areas. Similar fishing restrictions are also applied in all local Metsähallitus waters. The aim has been to protect 80% of the seals' breeding sites through such restrictions.

According to a research report published by the Finnish Game and Fisheries Research Institute and Metsähallitus in 2005, Saimaa ringed seals in the waters of Pihlajavesi eat a maximum of 8% of the lake's vendace stock, while fishing catches amount to about 30% of the stock. This suggests that fishers and seals do not compete on the same levels for fish. The fishers' associations have accepted the fishing limits in return for compensation.

Thanks to limits on access and fishing, more and more seal pups are surviving in their dens, avoiding fishing nets, and living to reproductive age. The area where limits are applied was increased during 2005 to 550 km², including State-owned waters, and about 60% of all seal pups were born in this area. The existing measures would seem to suffice for the time being to ensure that the seals' birth rates exceed mortality rates. It is hoped that the Saimaa ringed seal's total population will reach 400 by 2020.

Species conservation and tourism problematic to reindeer herders

It is considered that protected areas generally have a positive impact on reindeer husbandry in Finland. But the conservation of large carnivores in the reindeer husbandry region leads to serious differences of opinion between conservationists and reindeer herders. Reindeer are easy prey for wolves, and the presence of wolves can greatly hinder reindeer herding and round-ups. Compensation is paid out at levels corresponding to double the value of the discovered reindeer carcasses, but this is not considered to be enough by the herders, since recovering carcasses is time-consuming and costly.

A management plan finalised in 2005 for Finland's wolf population does not propose any increase in wolf numbers in the reindeer husbandry region. This represents an exception to the general principle of protected area management that all animals native to the areas should be protected. Permits are granted for wolf hunting even in national parks. South of this region it is hoped that wolf numbers will increase, but the protected areas in the south are so small that they have little significance in terms of wolf conservation. The objectives specified in the legislation passed to establish protected areas in the north

mention wilderness-like nature, so efforts to exclude wolves go against this aim.

At present it is hard to envisage a rapid resolution to this contradiction. A compensation system for reindeer losses based on the locations of predator territories has worked well for golden eagles, but seems unlikely to be extended to cover kills by wolverines, wolves or bears. Predators are still despised, and illegal hunting clearly affects at least wolf populations. There are no longer such problems where eagles are concerned, since the compensation system is perceived as fair. Incidents of illegal wolverine and bear kills become evident on an annual basis, and some may well remain uncovered.

The increasing use of protected areas for tourism has also resulted in conflicts with reindeer herding in some areas. In Urho Kekkonen National Park, for instance, in the vicinity of the Saariselkä tourism centre, it has been shown that female reindeer with calves avoid tourists. Spreading developments around tourism centres restrict the natural movements of reindeer and, in some cases, also hinder the traditional gathering of reindeer for the ear-marking of calves or annual separations. But since more and more reindeer herders are gaining part of their income directly or indirectly from tourism, attitudes towards tourism are more favourable today. Tourism brings customers who can be encouraged to buy reindeer products, eat reindeer meat, visit reindeer farms, and enjoy excursions on reindeer sleighs. This helps to maintain reindeer husbandry in a situation where fewer people are able to make their full-time living from traditional herding.

Conflicts between tourism and other land uses are resolved through cooperation with local actors. In optimal cases such issues can be resolved at an early stage through natural resource planning procedures.

9.2.3 Nature Tourism Boosts Local Economies

Settings for recreation are among the many services provided by natural environments (also known as ecosystem services, see Section 6.1). From the perspective of the sustainable use of protected areas and natural resources, the recreational use of nature and nature tourism require

ecological sustainability, while at the same time, they clearly support economic and social sustainability.

The benefits of conservation for recreation and tourism can be interpreted from two angles. Firstly, the impacts of the recreational use of protected areas on business, incomes and employment can be examined on a local scale. On the other hand, the non-financial benefits obtained by people using protected areas for recreational purposes can also be assessed and measured. These benefits relate to the psychological well-being, health benefits and social relationships obtained through experiencing natural environments.

It is possible to assess the impacts of protected areas in terms of local or regional socio-economic well-being by examining the financial flows derived from tourism. Tourists purchase a wide range of goods and services in connection with their visits to protected areas, creating income and jobs in local areas.

The impacts of recreation and nature tourism on local and regional economies have only been studied in Finland over the last few years. The first such reports on the economic impacts of hiking areas and nature reserves looked at the impacts of individual areas on local economies. Surveys concerning the national hiking areas of Teijo and Ruunaa were completed in 1998 and 2003, respectively. The impacts of nature tourism in Archipelago National Park on incomes and employment in neighbouring municipalities were assessed in the summer of 2004 (see Information Box 27). Metsähallitus's own visitor surveys have examined visitors' spending patterns both overall and focusing on specific spending categories for each area. The consequent results can be used for estimates and calculations of the impacts on local economies, and combining such data can give some indication of wider regional economic impacts.

In 2003 it was estimated that the overall economic benefit of recreation and nature tourism in the most popular national parks and other protected areas to local economies amounted to some 230 million euros. It has been forecast that total income from nature tourism will rise to 310 million euros by 2010. The local economic impacts of nature tourism supported by protected areas have proven to be most significant in Lapland and in NE Finland.

National Park Visitors Bring Income and Work to the Archipelago

Knowledge of the impacts of the Metsähallitus NHS's operations has traditionally focused on ecological effects. Nowadays, it is most important to also study social and economic impacts. One such example is a study conducted in 2005 into the regional economic impacts of nature tourism in the Archipelago National Park.

According to the study, tourists in the Archipelago National Park spend an average of 53 euros on products and services bought locally during their visits. Over the year this adds up to about 3.6 million euros of income from nature tourism. The study area included the municipalities where the national park is located (Dragsfjärd, Houtskär, Korpo and Nagu) and the nearby town of Pargas.

Most of this income goes directly to enterprises offering products or services to tourists. Knock-on effects are very low, because it is difficult to find primary suppliers for product inputs in the Archipelago region itself, and such purchases therefore have to be made further away. Catering services such as retail shops, restaurants and cafes get most income. Fuel sales are also important.

Nature tourism in the national park provides workers from the Turku Archipelago region with a total of 26 man-years of employment, divided between forty part-time and full-time workers. Catering and accommodation employ most

workers. In addition, maintaining recreational facilities in the Archipelago National Park gives work to more than ten people, amounting to 3.5 man-years altogether.

The municipalities of Dragsfjärd and Nagu, and their residents and local enterprises, benefit most from the national park in financial terms. Pargas, Korpo and Houtskär also gain considerable income and employment, as do the municipalities nearby the park, but to a lesser extent. Together the municipalities of the Turku Archipelago earn about 100,000 euros annually in local taxes paid on income from tourism in the national park.

The material used in this study was collected by surveying visitors and local enterprises. Comparable studies have been carried out in two other areas managed by Metsähallitus: the national hiking areas of Teijo and Ruunaa. In Ruunaa the effects of nature tourism on the regional economy are of a similar scale to those in the Archipelago, but in Teijo such effects are substantially smaller.

Source: Berghäll, J. 2005: Saaristomerén kansallispuiston luontomatkoilun aluetaloudelliset vaikutukset. [Regional socio-economic impacts of nature tourism in Archipelago National Park.] – Metsähallituksen luonnonsuojelujulkaisu. Sarja A 153. 65 p.



Sailing boats at Berghamn Island in the Archipelago National Park. The park offers excellent conditions for boating. Many islands have sheltered coves and resting sites with facilities. The old fisherman's cottage at Berghamn today serves as a nature information point. Photo: Seppo Keränen.

The regional economic significance of tourism is greatest in Lapland. The numbers of tourists visiting Fell Lapland and Northern Lapland have grown rapidly since the mid 1990s, especially in national parks. Annual visitor numbers in Urho Kekkonen National Park, for instance, rose from 60,000 to 165,000 over the period 1992-2005. The tourism strategy of the Regional Council of Lapland incorporates targeted increases in overnight stays of 2% for Finnish tourists and 4% for tourists from abroad. This would mean an increase in the annual number of overnight stays in commercial accommodation in Fell Lapland and Northern Lapland from just over a million in 2003 to about 1,2 million by 2010.

In 2004 the University of Helsinki and the Finnish Forest Research Institute studied the spending behaviour of visitors to Pallas-Ounas-tunturi National Park both in the park and in its surroundings, aiming to devise suitable methods for reliably assessing the economic impacts of the recreational use of areas, also for comparative purposes. This study applied methodology already used in the United States for visitor surveys and input-output analyses.

The local economic impacts of Pallas-Ounas-tunturi National Park were found to be considerable. According to research, a single euro spent in or near the national park creates an overall benefit of 1.27 euros in the local economy due to the further circulation of the money spent. The employment impacts of tourist spending were found to create at least 160 permanent jobs and salary impacts totaling about 3.5 million euros. The study confirmed that nature-based tourism benefits the local economy in the region around this large and popular national park much more than other recreational and protected areas.

There is still uncertainty about the local and regional impacts of nature tourism, however, due to the lack of any widely accepted methodology for such analyses. To develop methodology further, the Pallas study should be replicated in different kinds of protected areas. One study in progress is examining the local impacts of the Seitsemien National Park using two different analytical methods at the same time. This will provide valuable new information on the relative costs and comparability of these two methods.

Jobs in nature tourism can help outlying regions to thrive

Developing nature tourism, creating suitable conditions for tourism and employing local people can help to improve the economic viability of remote rural regions. The overall employment impact of nature tourism in Finland was estimated in 2000 to amount to approximately 32,000 man-years. In the VILMAT Action Plan, which was initiated in 2003, it is estimated that the number of such jobs could be doubled through the development measures within the programme to 64,000 by 2010. The regional employment impact of Metsähallitus's recreation and nature tourism focus areas was considered to be about 3,400 man-years in 2003. After further investments in facilities in protected areas and increases in visitor numbers this total employment impact is expected to rise by about a thousand man-years by 2010.

Metsähallitus is focusing development projects in areas where nature tourism is increasing, and where national parks or other protected areas form key attractions. The greatest increases in the numbers of visits are predicted for the extensive national parks of Northern Finland, and facilities in these parks are to be developed as part of wider regional development plans. The expected employment impacts of these projects have been calculated on the basis of visitor surveys in Metsähallitus areas and Statistics Finland data on municipality-specific unemployment rates and dependency ratios.

The immediate employment impacts of the projects within the VILMAT Action Plan are expected to be particularly significant in the Lapland and Kainuu regions, where unemployment and dependency rates are much higher than in Finland on average. In some municipalities in Lapland and Kainuu unemployment was as high as 17-25% in 2003, when the average rate for Finland was 11.5%, while the dependency ratio was 1.5-2.4 compared to the Finnish average of 1.3. The statistics also show that in the same municipalities the numbers of inhabitants may be declining by as much as 2% per year. Reaching the targets set for tourism development could have considerable positive compound effects in such localities.



A day's worth of cloudberries. Picking berries and mushrooms is a popular form of recreation in forests and bogs, but it also brings significant income to locals in eastern and northern Finland. Photo: Erkki Tuovinen.

In Southern Finland employment levels in 2003 were more favourable than in Northern Finland, with the exception of the region of North Karelia, which had unemployment levels comparable to those in Lapland. In the south there are also many tourist attractions outside protected areas, so the employment impacts of developments associated with national parks and other such areas are less significant. The protected areas in the south also tend to be smaller than in the north, so their overall employment impacts tend to remain more localised.

Local perceptions of conservation and nature tourism

The attitudes of local residents towards nature tourism and related developments have only been studied to a limited extent. Local residents' attitudes to nature conservation and nature tourism were surveyed in Ostrobothnia around Kuusamo and Syöte in 2003 as part of a wider research programme examining the sustainable use of natural resources. Respondents were, on average, favourable towards both conservation and nature tourism, but such attitudes were not consistent.

Most local residents felt that protected areas help to preserve valuable natural features and increase the appeal of their areas to tourists. Their benefits were seen as being reflected in increasing numbers of tourists and consequent impacts on local economies. In the Syöte region, nature tourism was also perceived as helping to keep local services alive, and even improving them. Negative perceptions of conservation relate to assumptions that prospects for farming and forestry are weakened by conservation, and that fishing and hunting are more strictly controlled. Particularly around Oulanka National Park soil erosion and litter were perceived as negative impacts of nature tourism. Conflicts between local people and tourists were also seen to be possible due to the disturbing behaviour of tourists.

9.2.4 Natural Products Bring Income to Eastern and Northern Finland

Picking wild berries in forests and mires is the most popular way for people to benefit from Finland's traditional "everyman's right" of access to the land and its natural products. Berry-picking is especially common in Eastern and Northern

Finland, where two out of three adults pick wild berries at least once a year. Picking wild mushrooms is slightly less popular than berry-picking in all regions. It is, nevertheless, widely practised, especially in Eastern Finland, where about half of all adults pick wild mushrooms each year.

In 2000 approximately 5.8 million kilos of wild berries were sold in Finland. It has been estimated that about a quarter of the picked wild berries are sold, which suggests that around 20 million kilos of berries are picked per year overall. There is no detailed information about the quantities of berries picked in Metsähallitus lands, but commercial berry-picking is most significant in Eastern and Northern Finland, where many forests are owned by the State. Considering the proportions of land owned by the State it has been estimated that some 2.3 million kilos of wild berries and 97,000 kilos of mushrooms to be sold are picked each year in Metsähallitus lands. It was estimated that the total value of the berries picked in State lands for commercial use was about 2.8 million euros in 2000. Commercial mushroom-picking is most important in Eastern Finland, where mushrooms with a total value estimated at 174,000 euros were sold.

No information is available about the proportion of the estimated benefits, obtained from the picking of natural products, that are derived from protected areas. It might be possible to calculate rough regional estimates on the basis of the proportions of State-owned lands that are protected areas. In any case only a very small fraction of the total potential harvest of wild berries and mushrooms is ever exploited, and the picking of berries and mushrooms for household use has no significant negative impacts on nature or protected areas.

9.2.5 Well-being Enhanced by Outdoor Activities in Nature

The many benefits of exercise for health and capability are well documented. Outdoor activities, such as brisk walking, cross-country skiing, cycling, running or rowing, are all good ways for people to stay fit. Such activities have great benefits for public health, as they help to prevent conditions, such as cardiovascular diseases, diabetes and osteoporosis, and thus reduce the need for health care.

The desire to keep fit is one of the most important motives for nature recreation. Visitor surveys have shown that the users of hiking areas and protected areas are typically people who regularly enjoy outdoor activities. A wide range of facilities provides people of different ages and levels of fitness, including people with disabilities, possibilities to enjoy different kinds of outdoor activities in nature.

Other benefits of outdoor activities for the well-being of individuals relate to people's experiences of nature and the activities they can enjoy in natural settings, as well as the opportunities such experiences give people to relax in peace or socialise (see Information Box 13, p. 105). Such benefits to individuals' well-being cannot be objectively measured, since they are experienced subjectively. Alternative reasons for visits to protected areas, listed in the visitor surveys conducted by Metsähallitus, include: to be alone, mental well-being, relaxation, to be together with friends, and to be together with the family. Many visitors have responded that they come to relax, enjoy outdoor activities and observe nature with their families.

It is difficult to estimate the value of outdoor activities in State lands in economic terms. Even walks of fairly short duration in natural surroundings suffice to meet recommendations for health and fitness. The total number of visits to protected areas and other State-owned nature areas, estimated at more than 4.5 million a year, illustrates the scale of such benefits. Mental health impacts can be assumed to be significant at least indirectly, since Metsähallitus's visitor surveys indicate that people often return to the same protected areas, where they have previously enjoyed experiences in natural surroundings.

9.2.6 Visitors are Satisfied, but Are Attitudes Changing

Around 1.7 million visits to Finland's protected areas and more than 700,000 visits to visitor centres are registered every year. More than 60,000 fishing permits and 38,000 hunting permits for use on State lands are sold annually. Customer satisfaction among the leisure users of Metsähallitus's services is measured regularly through the continuously collected feedback forms distributed at customer service points and through

regular surveys of visitors and customers. Despite recognised deficiencies in services, the overall customer satisfaction index has remained high throughout the 2000s, at well over 4 for visitors to protected areas and about 3.5 for hunters and fishers, on a scale of 1-5.

Customers can therefore be said to be satisfied overall, although so far there is little information to indicate how their satisfaction with facilities and their favourable experiences affect their environmental attitudes and such factors as the overall approval of protected areas. Information on the impacts of visitors' experiences and learning could also help to reach new customer groups in the future.

More data is needed also on the impacts of nature interpretation and environmental education. More than 60,000 customers are provided with guidance and interpretation in visitor centres and in the field every year, while hundreds of thousands of customers independently benefit from exhibitions and nature trails. The websites featuring protected areas and hiking services received more than a million visits in 2005. But there is no research data as yet to indicate what people have learnt or how their learning has affected their behaviour in environmental terms or their attitudes more widely.

More research and monitoring should be conducted in Finland to discover how well protected areas are known and their significance is understood. One of the key objectives of Parks Canada, for instance, in its management of national parks and historical sites, is to get visitors to participate in guided activities to help improve their understanding of natural and cultural values as part of Canada's national heritage. Experiences and learning can increase people's interest in the management of protected areas and help build public appreciation and support for conservation work in terms of resources and voluntary work contributions.

9.3 Setting an International Example

In the management of protected areas, Metsähallitus strives to realise the goals that international agreements and programmes have set for the protection of biodiversity and cultural heritage. The NHS also actively participates in European and global networks' efforts to promote the good

management and sustainable use of protected areas. Exemplary work has earned positive international feedback. Representatives of Finland's nature conservation administration have worked actively in various international contexts to share information on successful practices and acclaimed results that Finland has achieved in the protection of biodiversity and the management of nature reserves. Finland is an internationally popular destination for study trips among professionals in the protected area management field, and a desirable partner for international projects.

9.3.1 Acclaim for Quality Work

Management of two national parks awarded European diploma

The European Council created the European Diploma of Protected Areas, which may after detailed evaluations be awarded to valuable and well-managed European protected areas for five-year periods. The Council's diploma has so far been granted to 61 protected areas in 22 European Council member countries, and to one area in Belarus. Seitsemien National Park and Ekenäs Archipelago National Park both received diplomas in 1996, and these were renewed in 2001 and 2006.

The European Council's committee of ministers, which granted the diploma, suggests that recommendations given by evaluators of protected area management effectiveness in 2004 are taken into account by managers of both parks. The expansion plans for Ekenäs Archipelago National Park should duly be updated within two years, and the park's management plan also needs to be renewed. The committee supports the continuation of mire and forest habitat restoration in Seitsemien and suggests the drafting of a plan for nature interpretation. The formulation of management plans for both parks is already under way.

Sustainable tourism in Syöte National Park

Syöte National Park was accepted in 2004 for the European National Park Federation's (EU-ROPARC) European Charter programme, which aims to develop sustainable tourism in European protected areas. The programme may



Ekenäs Archipelago National Park. Most of the park consists of water areas. The park's boundaries encompass three of the four archipelago zones from the inner archipelago to the outer marine zone. Metsähallitus has been granted a diploma by the European Council for the exceptional management of this beautiful national park. Photo: Vallas.

be joined by signing up to the European Charter for Sustainable Tourism in Protected Areas. A total of 23 parks from around Europe had signed up to the Charter for Sustainable Tourism by 2006. Syöte National Park was the first national park in the Nordic countries which signed the charter, and Koli National Park applied to join the programme in 2007.

Protected areas that apply to join the European Charter programme must have a sustainable tourism strategy and an action plan to realise their aims prepared in cooperation with the area's stakeholders. Charter membership is granted for 5-year terms, during which time the sustainable tourism action plan should be implemented. Parks may re-apply for membership after the five-year period has elapsed, at which time the sustainable tourism development process continues according to a new action plan. Signing the charter on sustainable tourism has given Syöte the right to use the European Charter logo as a sign that sustainable tourism is being developed in the park in an ex-

emplary fashion. Information Box 26 describes how the environmental impacts of nature tourism in Syöte National Park are monitored.

Oulanka-Paanajärvi – a model for transboundary cooperation

In 2002, Oulanka National Park was one of the first three parks to receive certification from the PAN Parks Foundation, which was founded by the WWF and the Dutch company Molecaten. Oulanka's success in harmonising nature conservation with the growing pressures of nature tourism has been exemplary. The certificate is granted to parks based on strict principles and criteria regarding the good management of natural values and the sustainability of nature tourism. Certification was also awarded three years later to nine Oulanka National Park cooperation enterprises and to Paanajärvi National Park, Oulanka's twin park over the border in Russian Karelia. The two parks have long worked in close cooperation.

The EUROPARC Federation has also developed its own criteria for “Transboundary Parks – Following Nature’s Design” certification, to promote model transboundary cooperation. Oulanka and Paanajärvi National Parks received this extra recognition in 2005. Collaboration between the twin parks is described in Information Box 23, p. 216.

9.3.2 Cornerstones of Success

A nationally integrated and cooperative administration of environmental issues and natural resources is a rare phenomenon. An organisation like Metsähallitus, where business units exploiting natural resources and a publicly-funded unit administering nature conservation tasks operate under the same roof, is exceptional from an international perspective. The national working methods of this large organisation, with its common knowledge base and diverse and multi-level cooperation networks, have formed the cornerstones of the organisation’s success. They can also provide building blocks for the development of organisations managing nature reserves elsewhere.

Metsähallitus has helped to develop the administration of nature conservation on many levels in various countries. Such cooperation has,

at the same time, enabled Metsähallitus to learn and to use new ideas to improve its own activities. Some examples of the ways that the NHS has promoted the exchange of ideas and the effective practical management of nature reserves in recent years are presented in Table 39.

Global goals, national organisation, and local actions

Nature conservation and protected area management objectives in Finland are based, to a large extent, on international agreements and the goals set by action plans to which Finland is a signatory. The aims of the Convention on Biological Diversity are promoted in almost every field of activity with the help of national strategies and action plans. The main ministries concerned and the national environmental, forestry and nature conservation administrations cooperate closely at regional and local levels.

The NHS strives for an open and interactive approach to the planning and management of protected areas, which helps to integrate different kinds of demands and objectives related to their use. The goal is for this work to be carried out practically and cost-effectively, making use of the best available information and keeping the needs of stakeholders in mind.

Table 39. Ways employed by the Metsähallitus Natural Heritage Services to exchange ideas so as to improve the effectiveness of protected area management. Know-how has been shared at many levels and disseminated in many directions. Source: Metsähallitus.

Mode	Field visits	Twin park cooperation	Long-term cooperation
Example	US National Park Service 2001	Russian border parks (Green Belt)	China Hunan Province nature conservation
Primary objective	Benchmarking	Conservation of boreal nature	Implementation of CBD programme of work on PAs
Participants	National key experts	Local staff of border PAs	Expert groups
Information flow	Top down	Bottom up	Multilevel
Frequency	Occasional	Continuous	Annual
Themes	PA management and leadership	Practical PA management	Based on framework agreement outlining themes



Cooperation on the preservation of biodiversity in China. Natural Heritage Services director Rauno Väisänen has been actively involved in collaboration between Metsähallitus and the nature conservation officials of the Hunan Province since the beginning of the 1990s. Photo: Anneli Väisänen.

Leadership and business management

The operational practices of the state enterprise and close cooperation with the business units of Metsähallitus have created a good basis for NHS's cost-conscious activities and continuous improvements in productivity. The definition of a mission, vision for 2010 and strategic goals for the NHS has greatly facilitated the longer-term concentration of resources for core activities and conservation sites.

Turning development and conservation activities into projects has made the overall management of protected areas more efficient and produced extra funding for activities, such as the realisation of Natura sites and their objectives. Purposefully making services more customer-oriented has resulted in persistently high levels of customer satisfaction. The reliability of operations and know-how across a wide range of fields have helped the NHS to maintain a good public image. The NHS also has a good reputation as an employer. Levels of job satisfaction have remained quite good, despite the pressures caused by changes and increased productivity demands.

Efficient knowledge management

A valuable resource is formed through the interaction of the knowledge and competence of the people who work in an organisation, the prevailing values and attitudes in and around its work community, and its information and communication systems. This intangible capital has human, organisational and relational elements. It includes creativity, along with the working atmosphere that encourages it, as well as functioning relationships with clients. The accumulation of organisational knowledge and relational capital is a long process, which must be attended to continuously.

The NHS organisational capacity is based on a capable and motivated staff, a supportive working environment, and on efficient information management and operational processes. The administration of areas and their resources is supported by comprehensive geographical information systems, and the planning and monitoring of the management and use of protected areas by user-rights administration and customer information systems. The organisation provides a wide range of expertise, which is used both regionally

and nationally. Competences are developed with the help of the sharing of good practices and systematic training. Standardised and integrated working methods aim for efficiency. Activities are developed on the principles of adaptive management and continuous improvement based on monitoring and evaluation results and a diverse feedback system. New ideas are sought from all over the world through cooperative networks, and methods are developed together with research communities.

Effectiveness through partnerships

Cooperation and partnerships create new ways for the promotion of common goals. Combined resources and networks also make it possible for action to have greater and wider impacts. Partnerships with local tourism enterprises based on agreed operating principles enable the increased provision of nature tourism services in national parks in ways which are sustainable with regard to both the environment and local communities.

Framework agreements and long-term cooperation with research institutes has improved the efficiency of the use of protected areas, personnel, equipment and results, with consequent benefits for both research and practical work.

The NHS and the regional environment centres have been able to advance their common goals with the help of many EU-funded projects on both regional and national levels. At the same time, permanent cooperation networks have been created with other local and regional actors, such as game management districts, educational institutions and NGOs. Such networks have helped to achieve significant results, through schemes such as the EU LIFE-funded bird wetland restoration and management projects (see Information Box 28). Transboundary cooperation has generated good results which are shared and can be assumed to spread, on both sides of the border, within the twinned parks and also more widely through the protected area administrations (see Fig. 59).

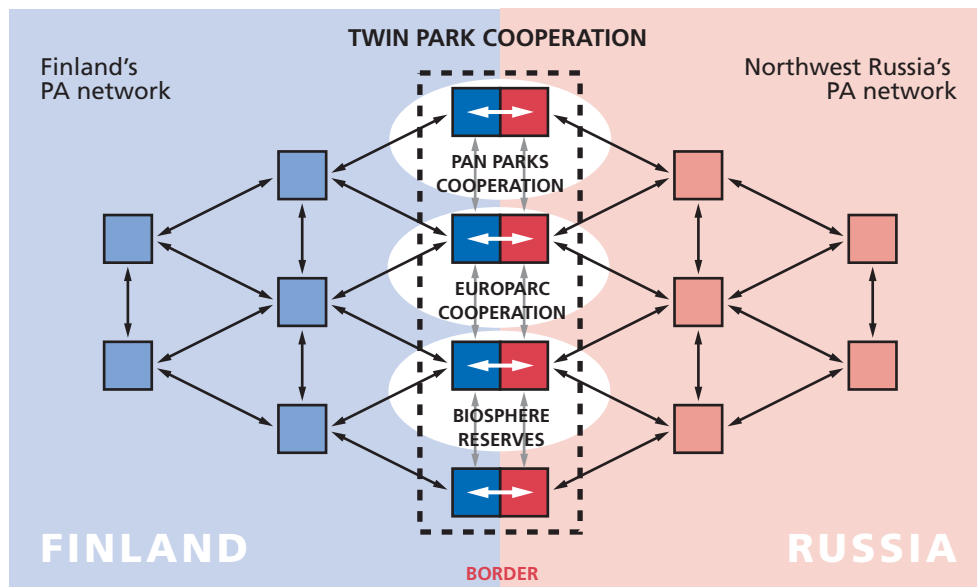


Figure 59. The Twin Parks model of transboundary cooperation between Finland and Russia. Sharing the experiences and know-how gained through transboundary cooperation can help to spread positive impacts and ideas through protected areas and even entire networks on both sides of the border. Source: Metsähallitus.

Notable Results in Managing and Restoring Bird Wetlands

The LIFE CO-OP project “Best practices in Finnish wetlands – networking for improved wetland management” evaluated six LIFE Nature projects in Finland. The projects covered 21 Natura 2000 sites containing some of the most significant waterfowl habitats in Finland, from coastal bays to wetland lakes.

The LIFE CO-OP project evaluated the benefits to conservation from the projects carried out with EU LIFE Nature funding, as well as their local socioeconomic impacts, project administration, methods used in restoring waterfowl habitats, and any facilities built in the area. Evaluations also looked at how birds, vegetation, biotopes, water quality, fish and aquatic invertebrates were monitored during the projects, and examined how geographical information systems were applied in restoring waterfowl habitats.

EU LIFE Nature funding has enabled significant waterfowl habitat restoration and management projects that would otherwise have been delayed or never realised. The evaluated projects have been beneficial to conservation in many ways. Restoring and managing wetlands has increased the diversity of their bird-life, while facilities have been improved, meaning that they can now be better used for nature tourism and teaching. Based on the experiences gained through these projects, recommendations were given for the future restoration and management of waterfowl habitats, on the construction of facilities, and on monitoring methods. An urgent need for a comprehensive guidebook on monitoring was identified.

Despite the good results gained in the evaluated projects, the report of the CO-OP project focused on the fact that much of the national Bird Wetland Conservation Programme, which was approved in 1982, has still not been implemented. In 1997 the Finnish Environment Institute and the regional environment centres evaluated waterfowl habitats included in Natura 2000 proposal, and found that 163 sites were in need of restoration and management.

In 2003, priorities were defined for the restoration of valuable wetlands in Finland, based on changes in their vegetation and birdlife, occurrences of threatened species, and the conservation values of the wetland sites calculated on the



basis of their nesting bird species. Management and restoration measures had been initiated at 55 sites by the end of 2005. At half of the sites basic restoration work had been already carried out, and annual management measures, such as pasturing and mowing, had also been started. Management plans were ready for 14 sites, and plans for a further 20 sites were under preparation. However, many sites were still in urgent need of restoration.

Significant changes have occurred over the last two decades in wetland environments, in bird-life and in the international field of bird conservation. These changes make it vital for Finland to create a national wetlands strategy, which should assess the factors threatening waterfowl habitats, update related conservation guidelines, and define management principles and national objectives. In addition, an action plan for the restoration of wetland sites should be prepared together with a related programme of funding.

Source: Mikkola-Roos, M. & Niikonen, T. 2005: Best practices in the restoration and management of wetlands at six LIFE sites in Finland – Results of the LIFE Co-op Project. – Metsähallituksen luonnonsuojelujulkaisuja. Sarja A 149. 120 p.

10 Looking Ahead

The development of Finland's protected area network and the Metsähallitus Natural Heritage Services (NHS) management of protected areas will continue to be guided over the coming years by:

- The UN Convention on Biological Diversity (CBD) and its 2010 targets and programme of work on protected areas
- The EU Habitats and Birds Directives and other EU conservation objectives
- Finnish Government policies inscribed in the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016, the METSO Forest Biodiversity Programme for Southern Finland, the VILMAT Action Plan to Develop Nature Tourism and the Recreational Use of Natural Areas, and in the decisions concerning the protection of the Baltic Sea.

10.1 Saving Nature for People

The three main objectives of the CBD are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilisation of these natural resources. The main idea behind the convention is to integrate the conservation of biodiversity into all activities that affect nature, including agriculture and forestry, fishing and hunting, planning and construction, housing and tourism. In the long term the only way to guarantee the availability of natural products and services that are vital to human well-being is to safeguard the structures and functions of ecosystems.

To achieve the objectives of the CBD its signatory countries have together launched programmes of work to help define practical actions, to monitor the effectiveness of these actions using indicators, and to conduct the related reporting. At a national level the parties to the CBD work towards its objectives with the help of their own action plans.

10.1.1 Countdown 2010

The main themes and objectives of the CBD have been compiled into a framework programme of work and action aiming towards biodiversity targets defined for 2010. The 2010 biodiversity target framework has seven focal areas:

1. Reducing the rate of loss of the components of biodiversity
2. Promoting the sustainable use of biodiversity
3. Addressing the major threats to biodiversity
4. Maintaining ecosystem integrity and the provision of goods and services provided by biodiversity in ecosystems to support human well-being
5. Protecting traditional knowledge, innovations and practices
6. Ensuring the fair and equitable sharing of benefits arising out of the use of genetic resources
7. Mobilising financial and technical resources, especially for developing countries.

Additionally 11 goals, 21 targets and a set of related indicators have been defined for the purposes of monitoring within this framework. The most important targets concern protecting ecosystems (10% of each ecological region), improving the statuses of threatened species, reducing the rates of loss and degradation of natural habitats, controlling the spread of invasive alien species, and maintaining and enhancing the capabilities of the components of biodiversity to adapt to climate change. Other targets require that biodiversity-based products should be derived from sources that are sustainably managed, and that the biological resources and ecosystem services, that support sustainable livelihoods and local welfare, should be maintained.

Within the EU it has been jointly agreed that the ongoing loss of biodiversity should be halted by 2010. The declaration known as the Message from Malahide, signed in Ireland in 2004, sets out a detailed road map of sectoral

targets through which member states committed themselves to incorporate reductions in the threats to biodiversity into policies in all sectors. Other important targets concern actions to share the benefits arising from the use of biodiversity, to promote research and education, to increase awareness and know-how, and to intensify international cooperation. Also at Malahide the Countdown 2010 initiative was launched to activate all possible stakeholders to work towards the targets set for 2010.

Within the EU, the Natura 2000 network is seen as one of the most important tools to protect the biodiversity of habitats and species. Establishing the network and supporting it with the help of the careful planning of land use in surrounding areas and the consideration of the objectives of Natura sites in all economic activities are also key goals in the European Commission's Biodiversity Communication, which covers biodiversity policies for the period 2007-2013. This communication, published in spring 2006 under the heading *Halting the Loss of Biodiversity by 2010 – and beyond. Sustaining ecosystem services for human well-being*, outlines the EU's objectives on four key policy areas: biodiversity in the EU, the EU and global biodiversity, biodiversity and climate change, and the knowledge base.

10.1.2 Challenges Set by the Programme of Work on Protected Areas

Other aims and processes affecting the management of protected areas in addition to the targets for 2010 are derived from the thematic and cross-cutting programmes of the CBD. The programme of work on protected areas approved by the 7th Conference of Parties to the CBD requires Finland and the EU to take prompt action to slow the decline in biodiversity and to create a comprehensive, well-managed and adequately resourced system of protected areas by 2010.

The programme of work on protected areas focuses on the role of protected areas in achieving the CBD's three main objectives, while also supporting thematic programmes on the biodiversity of forests, inland waters, and coastal and marine environments.

The programme of work on protected areas has four main elements, addressing:

- direct actions for planning, selecting, establishing, strengthening and managing protected area systems and sites
- governance, participation, equity and benefit-sharing
- enabling activities (resources)
- standards, assessment and monitoring.

The programme's targets are linked to an implementation schedule extending to 2015 (see Appendix 20). The following review assesses these targets in relation to Finland's national biodiversity strategy. The same issues have also been linked, where possible, to the framework applied in this report to evaluate the effectiveness of the management of Finland's protected areas (see Information Box 3, p. 22).

10.1.3 Finland's Biodiversity Strategy 2006-2016

Finland's National Strategy for the Conservation and Sustainable Use of Biodiversity was defined in a Government decision-in-principle of 21.12.2006. This strategy applies at national level the goals and targets of the global monitoring framework of the 2010 target. The objectives of the CBD's programme of work on protected areas are also incorporated into Finland's National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity for the period 2006-2016.

The main goals of Finland's National Biodiversity Strategy are:

- to halt the loss of biodiversity in Finland by 2010
- to establish favourable trends in the state of the natural environment in Finland over the period 2010-2016
- to prepare by 2016 for global environmental changes that may threaten the natural environment in Finland, particularly climate change
- to strengthen Finland's influence in the preservation of biodiversity globally through international cooperation.

Five strategic objectives have been set to reach these goals:

1. to improve the conservation and management of biodiversity
2. to intensify sectoral responsibility
3. to improve the national knowledge base
4. to strengthen cooperation
5. to improve Finland's international influence.

To achieve the objectives of the strategy, a 110-point National Action Plan for the Conservation and Sustainable Use of Biodiversity has been drawn up through cooperation between different administrative sectors. The implementation of the strategy and the related monitoring will be overseen by a broad-based body made up of representatives of major stakeholders from the public and private sectors, including interest groups and NGOs.

10.1.4 Increasing Responsibility for Metsähallitus

All administrative and economic sectors are together involved in the implementation of the national biodiversity strategy. Key tasks in relation to the preservation of biodiversity are addressed within the nature conservation and forest administrations.

Efforts will be made to safeguard Finland's biodiversity in a changing environment according to outlines defined in the national strategy, with the help of both a comprehensive and high-quality network of protected areas, and the ecologically sustainable use and management of economically exploited areas. The favourable conservation statuses of species and biotopes will be safeguarded through active habitat management and restoration measures.

Metsähallitus, as the organisation administering a third of Finland's land area and almost all of the country's State-owned forests, and especially its NHS unit, which manages protected areas in State-owned lands, bear great responsibility for the implementation of the national biodiversity strategy and action plan. Even more State-owned lands will be concentrated under Metsähallitus's administration in the future, as the research forests and protected areas currently run by the

Finnish Forest Research Institute (Metla) are transferred to Metsähallitus from the beginning of 2008. Metsähallitus will also be managing new areas acquired by the State through the ongoing implementation of nature conservation programmes due to be completed by the end of 2009.

The operating environment is constantly affected by small changes in both the natural environment and the socio-economic context. The greatest challenges to nature conservation are gradual changes in habitats, and particularly climate change. The necessary actions are being intensified within the nature conservation administration to respond to these challenges. As part of an ongoing programme to improve the productivity of the whole environmental administration, the nature conservation administration and the allocation of the related tasks were reviewed during 2006, together with the potential for improvements in cooperation and data management.

Over the next few years the NHS's operations will particularly be affected by requirements defined for the planning, management and monitoring of sites within the Natura 2000 network. The management of protected areas will also be guided by the NHS's own strategic guidelines and the recommendations following the international management effectiveness evaluation of Finland's protected areas. The NHS is prepared to fulfil additional tasks related to new protected areas, if this is deemed to be desirable on the lines of a preliminary report on the allocation of work within the nature conservation administration. Activities have already been expanding in the direction of the sustainable use of natural resources following the transfer of administrative responsibility for hunting and fishing issues to the NHS. In the field of nature conservation, the main partners of the NHS will continue to be the regional environment centres, the Finnish Environment Institute, Metla and other research institutes, local and regional authorities, interest groups and local residents. In the conservation and restoration of forest habitats close collaboration with Metsähallitus's Forestry Unit will continue, and efforts to work with private forest-owners will be increased.

10.2 Improving the Conservation and Management of Biodiversity

The evaluation of the National Action Plan for Biodiversity in Finland 1997-2005 compiled comprehensive research and monitoring data on the current state of biodiversity in Finland. The evaluation also spotlighted major challenges related to the conservation of habitats and species. In spite of positive developments it was confirmed that the implementation of the measures within the action plan had not been sufficient alone to halt or even significantly slow the deterioration of habitats or status of threatened species. Many negative phenomena in Finland's forests, for instance, are the result of long-term trends which often continue to have delayed impacts, even though measures taken in recent decades have improved forestry practices noticeably. Structural changes in rural areas and the intensification of agriculture have also given rise to trends that have negative impacts on biodiversity. It has not been possible to stop the continuing eutrophication of the Baltic Sea. Climate change is already evidently leading to changes in vegetation and in the distributions and behaviour of animals. Intensified measures to be realised over the next decade will strive to induce more favourable trends.

10.2.1 Building Protected Area Networks

The main objective of the CBD's programme of work on protected areas is to create comprehensive, effectively managed, ecologically representative national and regional networks of protected areas, by 2010 for terrestrial areas and by 2012 for marine areas.

The programme obliges parties to the CBD to urgently act to establish or expand protected areas in any large, intact or relatively unfragmented or highly irreplaceable natural areas, or in areas under high threat, and to safeguard areas where the most threatened species occur. Countries should also have completed gap analyses of protected area systems for terrestrial and inland water areas by 2006, while representative networks of marine protected areas should be defined by 2008. The programme stresses that this work should be done in collaboration with the stakeholders concerned. By 2009 the

observed deficiencies in protected area systems should be corrected, applying new conservation means, such as the voluntary protection of privately-owned lands. Implementation plans and schedules must be drawn up, and implementation duly monitored.

Sections 4.2-4.3 and 9.1.1 of this report describe progress on the building up of Finland's protected area network until the beginning of 2006. The representativeness of the national network has been analysed in depth, with the exception of marine areas. The Helsinki Commission (HELCOM) has conducted a preliminary assessment of marine areas for the whole of the Baltic Sea. It has been possible to repair observed deficiencies in the conservation network to some extent by expanding existing protected areas and through the drafting of proposals and extensions for Finland's Natura 2000 network submitted over the period 1998-2005. The habitats of migratory species have been surveyed, especially with regard to the staging and nesting areas used by migratory birds now designated as nationally and internationally important bird areas (FINIBAs and IBAs).

Experiences of the first phase of the METSO Forest Biodiversity Programme and material from the related biodiversity research programme were compiled in 2006. During 2007 information is being collected to meet the reporting obligations of the Habitats Directive on the current states of directive species and biotopes found in Finland, incorporating the results of surveys of threatened biotopes. This information will enable a detailed assessment of the deficiencies of the protected areas network and the planning of possible corrective measures.

Before any possible new conservation programme, and alongside any such programme, current conservation programmes will be realised using the funding earmarked for such purposes until 2009, by acquiring areas designated for these programmes for the State, and establishing new nature reserves. At the same time Finland's Natura 2000 network will be realised. The ecological functionality and connectivity of the Natura 2000 network will also be enhanced with the help of regional land use planning measures, natural resource planning for State lands, and the more effective channeling of environmental subsidies for agriculture and forestry in ways that

favour nature conservation. Existing statutory policies and voluntary means to complement the network of protected areas will continue to be applied. Support for the development of protected area networks and administrations in neighbouring countries will also continue.

Realisation of the Natura 2000 network by 2012

Over the coming years the Natura 2000 network will play an increasing role in nature conservation in Finland and in the implementation of EU biodiversity policies. The EU Commission has made its final selections for six of the network's biogeographic regions: Macaronesia (2001), Alpine (2003), Atlantic and Continental (2004), Boreal (2005) and Mediterranean (2006). The network will still be built up in new member states.

According to the Habitats Directive, in order to build up the Natura 2000 network member states must establish nature reserves, known as special areas of conservation (SACs), draft the necessary management plans, and initiate any management measures urgently needed to help species and habitats maintain or achieve favourable conservation statuses. The next six-year reporting period for the Habitats Directive (2007-2012) requires that the impacts of the measures carried out to realise Natura sites must be assessed at protected area level.

Almost half of Finland's Natura sites are realised in the form of nature reserves established

under the Nature Conservation Act. By the beginning of 2006 nature reserves with a total extent of about 1,725,000 ha (17,250 km²) had been established, amounting to 35% of the total area of Finland's Natura network and three-quarters of the total area of the Natura sites due to be established as nature reserves. A third of Finland's Natura network consists of wilderness reserves established under the Wilderness Act and national hiking areas established under the Outdoor Recreation Act. Implementation by other legislation amounts to about 20% of the network (see Table 40).

Work on the drafting of statutes for the establishment of nature reserves, the formation of nature reserve cadastral units, management plans, and the demarcation of boundaries is continuing with the aim of fulfilling the requirements of the CBD's programme of work on protected areas and the Natura 2000 programme by 2012. To ensure that the remaining quarter of the nature reserves to be established under the Nature Conservation Act are effectively realised, a scheduled plan must be drawn up for the necessary drafting of statutes and formation of protected area cadastral units. The implementation of this plan should be commenced as soon as possible, and sufficient resources should be allocated for this purpose. This task will involve close collaboration between Metsähallitus, the Ministry of the Environment, the regional environment centres and the National Land Survey of Finland. The number of sites to be established is estimated to be about a thousand.

Table 40. The realisation of Natura 2000 sites in Finland by statute. The table shows the estimated areas and proportions of the network covered by different acts. Source: Ministry of the Environment.

Realisation	Estimated area (ha)	Proportion of Natura 2000 network (%)
Nature Conservation Act	2 300 000	47.0
Wilderness Act	1 487 000	30.0
Water Act & Environmental Protection Act	975 000	20.0
Land Extraction Act	50 000	1.0
Outdoor Recreation Act	32 000	0.8
Land Use and Building Act	25 000	0.5
Forest Act	15 000	0.4
Other legislation	10 000	0.3

Table 41. Means to support protected area networks in safeguarding the biodiversity of forest ecosystems especially in Southern Finland. Situation in 2005. Source: Horne et al. 2006.

Means	Policy type	Coverage
Strictly protected forests	Normative	1 665 000 ha
Forest Act, especially important habitats (in commercially managed forests)	Normative	130 000 ha
Habitat restoration (outside PAs)	Economic	
Forests		5 945 ha
Mires		4 871 ha
Sites protected voluntarily through the METSO Programme	Economic	1 057 ha
Environmental subsidy schemes*/**	Economic	1 915 schemes
Habitat management schemes		305 schemes
Collaboration networks	Informative	265 ha
Forest habitat management according to official forestry recommendations**	Informative	4.1 m ³ /ha decaying wood
Official advice on forest management**	Informative	217 370 persons
Ecological planning of private forests	Informative	1 094 530 ha

* Schemes in force 2005

** Forestry Development Centre Tapio Year Book 2005

Maintaining biodiversity in the forests of Southern Finland

Finnish legislation, land use planning processes and silvicultural recommendations include various tools for safeguarding biodiversity that can be used to support the network of more strictly protected nature reserves. These tools are listed in Table 41. Many have already been applied in Metsähallitus's natural resource planning and the METSO Forest Biodiversity Programme for Southern Finland. In the future such tools will become more important in the conservation of biodiversity.

Forests of different owner groups can be examined as part of wider forested areas by applying the ecosystem approach and using a combination of various conservation tools. Besides permanent strict protection, possible tools include the temporary protection of privately-owned forests and the conservation of their biodiversity through the application of natural habitat management methods. The connectivity of ecological networks can be greatly improved by combining small-scale sites from conservation programmes, private protected areas, sites designated under the Forest Act, and areas of forest protected tempo-

rarily by agreement with forest-owners under the METSO Programme or the Act on the Financing of Sustainable Forestry. The best results can be obtained where smaller sites can be conserved within commercially managed forests in the immediate vicinity of conventional protected areas. To further encourage the conservation of forest biodiversity, legislation can still be improved, and forest-owners provided with advice, planning know-how and subsidies.

10.2.2 More Effective Habitat Protection and Management

Important factors in habitat conservation include the quantity and quality of protected areas, i.e. their coverage and ecological representativeness. It is most cost-effective to protect and manage areas that are important for their biodiversity. In changing environmental conditions it is vital to achieve a sufficiently coherent network of protected areas to preserve biodiversity.

In supplementing Finland's protected area network it is important to emphasise both overall connectivity and the preservation of inadequately protected biotopes outside the scope of economic exploitation. Until the compiled results of the

ongoing evaluation of the threatened statuses of biotopes become available, conservation measures can be targeted on the basis of the listings of habitats in the Red List surveys of Finland's threatened species and other recent research findings on the habitat requirements of endangered species. Habitat restoration and rehabilitation are important ways to improve the effectiveness of protected areas and slow the loss of biodiversity. The need to restore habitats in forests, mires, wetlands and small inland waters so as to preserve viable populations of threatened and declining species is increasing steadily.

Metsähallitus intends to restore forest and mire habitats on a total area of 26,000 ha in protected areas within the METSO region of Southern Finland over the period 2008-2016. The goal is to implement restoration measures locally and regionally so that they increase the value of protected areas and support improvements in the ecological functioning of the protected area network. Habitat restoration methods and the management of monitoring data are still under

development. Monitoring networks are being set up for restored forest and mire habitats in State-owned protected areas.

Improving the natural state of inadequately protected habitats is also essential in areas that are exploited economically. It is important to be open-minded about the development of new types of voluntary conservation means and cooperation with landowners. Such work may involve small-scale restoration measures designed to support species conservation, which will nevertheless necessitate suitable funding.

10.2.3 Focused Action to Protect Species

The most significant threat to species is still change in their habitats. In addition to habitat protection, another challenge is to implement protection plans for individual species and effectively exploit legislative means, such as the delimitation (on commercially used land) of occurrences of species requiring special protection. Although the protection plans made for



The yellow marsh saxifrage (*Saxifraga hirculus*) is found in nutrient-rich fens. Its growth sites often represent small-scale and threatened habitat types, where other demanding and declining plant species are also found. The yellow marsh saxifrage is nationally vulnerable, and is protected in the EU under the Habitats Directive. Finland has international responsibility for this species as a major part of its European population grows in Finnish mires. Photo: Heikki Eeronheimo.

individual species are important, it is most vital to ensure that conservation measures are implemented effectively and their impacts are monitored. Measures should be prioritised for the species that most need protection, and especially for species that largely depend on areas managed by Metsähallitus. More resources are needed for species protection measures, such as the delimitation and management of occurrences.

One aim over the next few years is to further increase knowledge of the state of and current trends in Finland's species. This information is needed to direct conservation and management work. Data on threatened and directive-listed species is improved with the help of inventories. The monitoring of species requiring special protection and other important species must be carefully planned and ensured. Information systems on species will be developed, with data updated and the exchange of information between different actors improved. Species inventories will be enhanced to also serve, for instance, the monitoring of the state of biodiversity at national level. Preparations have begun for the fourth Red List evaluation of Finland's threatened species, which will be completed by the end of 2010. The NHS is involved in this evaluation, which is being coordinated by the Finnish Environment Institute.

There is a need for an overall assessment of species protection in Finland. The Ministry of the Environment aims to draft a species protection action programme together with other stakeholders, defining focuses, schedules and responsibilities.

10.2.4 Addressing Threats to Biodiversity

Habitat degradation will continue without preventive action

The habitats that maintain biodiversity are still being lost, fragmented and degraded outside protected areas due to the increasing construction of buildings and infrastructure, other land use changes, and high loads of nutrients and pollutants. Particularly alarming trends are evident in the well-being of Baltic marine ecosystems.

Marine life in the Gulf of Finland is seriously threatened by increasing shipping, and particularly the environmental risks associated with oil transportation. Pressures inside protected areas include increasing tourism in popular national parks and pressure caused by reindeer grazing across most of Northern Finland. Invasive alien species and climate change are also increasing threats whose overall impacts on biodiversity are not yet well understood.

Active measures to reduce the pressures facing habitats, especially in protected areas and their immediate vicinities, are continued with the help of extensive networks of collaborators. Ways to do this include participating in regional and local planning procedures, otherwise advocating for favourable land uses, and closely cooperating with stakeholders including local actors in the tourism sector and reindeer herders' district associations.

Measures to control invasive alien species urgently needed

The uncontrolled spread of non-native species through natural environments represents a considerable threat to biodiversity, even in Finland. Rapidly spreading alien species that alter the structures of ecosystems or out-compete and replace native species in their natural habitats are the most serious threats. Examples mentioned elsewhere in this report include the rugosa rose, which can take over sandy shores, and feral American mink escapees from fur farms, which can decimate the nesting bird populations of wetlands and islands. Harmful alien species can also have significant socio-economic impacts, especially in forests and aquatic habitats.

A significant challenge is to identify possibly harmful invasive alien species and chart the pathways they use to spread. A national strategy and action plan are needed to prevent the further spread of harmful species. Another related objective is to keep the impacts of non-native species under control with the help of national and international cooperation, especially through active participation in joint schemes involving the Nordic and Baltic countries.

Ways to adapt to climate change

Average annual temperatures in Finland are expected to rise by 1-3 degrees by 2020, with precipitation increasing by as much as 15% from average levels in the second half of the 20th century. The distributions of species and their inter-relationships are expected to change as vegetation zones and the ranges of dominant tree species gradually shift northwards. Some species will expand their distributions and populations, especially species that are able to spread rapidly and thrive in various types of habitats. The numbers of alien species and pests may also increase. But many species will suffer as their habitats shrink. Species and biotopes found in the north or at high altitudes may decline or vanish.

Changes in the temperatures and ice conditions in the Baltic Sea may affect the whole nutrient balance of marine ecosystems as well as the movements and reproductive capacities of marine species. The breeding prospects for the ringed seals of the Baltic Sea and Lake Saimaa may particularly be endangered, if no ice-cover forms in the waters where they live. The impacts on commercially important fish stocks could also be significant. Increased rainfall would leach more nutrients from soils into already overburdened aquatic ecosystems. Possible rises in water levels would alter shore ecosystems, many of which already face various land use pressures.

The connections between biodiversity and climate change entail new challenges in the context of the conservation and sustainable use of biodiversity in terms of need for more information and new kind of policy-making. New research data is required on the impacts of ongoing climate change on waters, mire ecosystems, wetlands and cold northern habitats, such as arctic fells and their characteristic species. Information is also urgently needed on the impacts of ongoing climate change on the ecology of protected areas, on processes that maintain biodiversity, on the relationships within species communities, and on the functioning of food webs. It may be possible to prepare to cope with climate change by conducting sensitivity analyses of ecosystems and species communities.

Finland's National Action Plan for the Conservation and Sustainable Use of Biodiversity proposes that a programme of research into adaptation to climate change should be realised by 2010. This programme would include the compilation of basic data for use in monitoring related to protected areas and decision-making. The goal is to assess the likely impacts of climate change on biodiversity and show what kinds of actions should be taken at the earliest possible stage to reduce or adapt to harmful impacts.

Experts believe that the following actions would promote adaptation to climate change:

- ensuring the geographical and temporal comprehensiveness of the protected area network by improving its connectivity, especially where environmental gradients are steep (e.g. where variations in altitude are great) or where habitats exhibit zoning (e.g. along land uplift coasts)
- expanding ecological networks into economically exploited areas (e.g. by creating ecological corridors and buffer zones connected to nature reserves, which would require larger-scale planning encompassing private lands)
- effectively preventing other harmful changes (e.g. actively eradicating alien species, restoring habitats, and steering land uses)
- giving special attention to species and biotopes which are scarce or occur in Finland on the edges of their ranges, especially if they are poorly represented in protected areas
- improving monitoring and indicators for sensitive species, especially those associated with arctic fells and nutrient-poor waters
- in extreme cases resorting to reintroductions where species have disappeared from their natural habitats.

Many of these measures would probably promote the preservation of biodiversity regardless of the rate of climate change and its ecological impacts.

10.3 Using Biodiversity Sustainably and Sharing Benefits

Using natural resources in sustainable ways will play a major role in achieving the 2010 biodiversity targets. A set of principles and guidelines for the sustainable use of biodiversity was approved under the CBD in Addis Ababa in 2004. According to these principles the management of natural resources should take into account the socio-economic context, and responsibility for activities should be scaled to the extent of resource use. Society should also support the sustainable use of biodiversity through legislation and economic incentives.

The principles require flexible and adaptive management practices. Interdisciplinary and participatory approaches should be applied in the management and governance of natural resource use. Adaptive management should be practiced on the basis of traditional and local knowledge as well as scientific data obtained through the monitoring of natural resources and their use. The principles also stress that local users of biodiversity components should be sufficiently empowered to be responsible for the use of the resources concerned, and that benefits should be equitably shared between stakeholder groups.

In Finland measures designed to safeguard natural resources, including forests, game, fish stocks and water, have long been enshrined in national legislation and local practices. More recently farmland, crop plants, livestock breeds, reindeer and natural products collected in forests have also been included among the renewable natural resources whose availability needs to be ensured in the long term. The sustainable use of renewable natural resources is applied as a guiding principle throughout the Ministry of Agriculture and Forestry's Natural Resource Strategy for 2010. The main goals of the strategy, in addition to the responsible use and management of natural resources, are the functioning of ecosystems, the preservation of biodiversity and rural landscapes, and the viability of related livelihoods.

The guidelines within the Natural Resource Strategy aim to ensure that management of forests and other habitats preserve biodiversity, including game and fish stocks, at sustainable levels, and that opportunities for recreational land uses remain favourable. Measures designed to maintain biodiversity include increases in the

numbers of managed wetlands and traditional agricultural biotopes, improvements in the restoration and natural management of forest habitats, the restoration and management of game and fish habitats, and improvements in the rotation of reindeer pastures. Natural products and environments can, together with eco-efficient land use and tourism, create opportunities for income that will help rural communities and local cultures to remain viable. Environmental subsidy schemes also support the sustainable use of natural resources. Any conflicts between the use of nature and conservation should be resolved through increased public awareness and the payment of compensation for any consequent losses incurred by people practising livelihoods based on natural resources.

10.3.1 Comprehensiveness and Cooperation Emphasised in Planning

The principles for the sustainable use of biodiversity are closely related to the principles of the ecosystem approach. The ecosystem approach is a wider and more comprehensive approach that sets clear objectives for the management of ecosystems. The objectives associated with the principles for the sustainable use of biodiversity are narrower, and mainly focus on the sustainable use of the elements of biodiversity within the frameworks of ecosystems. The aim is minimizing and, where necessary, repairing any harmful impacts on ecosystem services, including the structures and functions of ecosystems. Sustainable use represents one way to implement the ecosystem approach and safeguard ecosystem services.

In practice, applying the ecosystem approach and the principles for the sustainable and equitable use of biodiversity in protected areas involves the comprehensive planning of their management and use. Planning must be based on the best available knowledge, and be conducted together with any local stakeholders who benefit from the areas in various ways. The starting point is that the conditions needed for the preservation of biodiversity and other natural values must not be endangered. But within this constraint, efforts should be made to find ways to continue traditional local forms of natural resource use and to safeguard suitable conditions for local

livelihoods. Steps should be taken to increase the interaction between protected areas and the surrounding countryside by supporting rural livelihoods and integrating the management of protected areas and the natural features in their surroundings.

Integration into wider landscapes and seascapes by 2015

The CBD's programme of work on protected areas is being implemented according to the principles of the ecosystem approach. One of the programme's targets is that all existing and future protected areas should be integrated into their wider surrounding landscapes and seascapes by 2015. The ecosystem approach offers a framework, which facilitates understanding of the relationships between protected areas and wider spatial entities, and enables evaluations of the products and services available from protected areas (see Section 8.2.1). Suitable tools for preserving ecological structures and functions include ecological networks consisting of various types of areas, and habitat restoration.

With the help of large-scale planning, support areas and buffer zones can be set up in connection with more strictly protected core areas to further safeguard biodiversity (see Fig. 46, p. 159). In such areas suitable habitats for demanding forest species, for instance, can be maintained or expanded without completely abandoning objectives related to the use of such areas' forests and other natural resources. Support areas may also have other significant objectives related to recreation, game management or landscape protection, and they need not be defined as permanently as core areas. Habitats may also be restored and managed to promote biodiversity.

In State lands natural resource and forest planning have long aimed to establish ecological networks with the help of landscape ecological planning. Networks established at landscape level to safeguard biodiversity are made up of statutory protected areas, natural sites designated in landscape ecological planning (occurrences and habitats of threatened species, habitat types listed in legislation), and other forests permanently protected by Metsähallitus. Connective areas, such as ecological corridors and stepping stones, help to ensure the overall connectivity of eco-

logical networks. Such areas are either excluded from commercial forestry plans or may only be managed with restrictions. Other areas supporting biodiversity can be established according to Metsähallitus's environmental guidelines, as forests with environmental value or as recreational forests, for example. Other support areas include forests adjoining small nature reserves in Southern Finland, and areas designated within landscape ecological plans for safeguarding biodiversity, such as stands along shores or the margins of mires. In these areas forestry measures are also limited.

By the end of 2008 Metsähallitus's natural resource plans will all have been renewed. This will enable an overall evaluation of the ecological network created in State forests on a nationwide scale, and the need for the further development of this network. The means used to safeguard biodiversity in State lands can also be applied in private lands, if the planning scale is sufficiently large. This is the basic idea behind integrated spatial planning.

Planning Natura 2000 sites as networks

Over the coming years, the ecosystem approach will also be applied, where possible, in the management planning of protected areas. For such purposes suitable functionally coherent areas should be identified together with landowners, local residents and other stakeholders. The aim is to create cooperative bottom-up planning processes that also consider objectives and sites of socio-economic importance to developing regions.

Different ecosystems should be examined within areas defined for such planning, including forests, waters and agricultural environments, as well as their interrelationships and local needs and pressures affecting selected ecosystem services. For instance, the hydrological states of mires should be assessed for entire catchment areas, with the necessary plans then made to safeguard their natural state. Objectives defined for the conservation of valuable bird wetlands should be adjusted to suit the conservation needs of wider ecosystems and also better favour activities, such as the sustainable hunting of waterfowl.

Management plans still need to be drafted for about 200 Natura sites administered by

Metsähallitus by 2012. From 2007 onwards it is intended that plans for at least 30 Natura sites will be completed every year. Various types of protected areas can be purposefully bunched together under single management plans, including privately-owned areas where they form part of wider Natura entities or other local networks of protected areas. One good example of such wider-scale planning is the ongoing drafting of a management plan that will encompass the Perämeri National Park and nine other Natura sites in the Bothnian Bay.

10.3.2 Joint Efforts to Protect the Environment and Human Well-being

The well-being of people and nature are major factors behind the principles defined for the ecosystem approach and the sustainable use of biodiversity. The ecosystem approach stresses the importance of understanding and preserving ecological functions and structures, but also emphasises the importance of people and the need to make the means applied in managing ecosystems more flexible. Approaches are needed that will reduce the harmful impacts of socio-economic activities on nature, while at the same time safeguarding the livelihoods of people dependent on the use of natural resources.

Preserving and maintaining natural and cultural values is the primary function of protected areas, but areas can still be managed so as to support local communities economically in many ways. Procedures and practices for the use of protected areas for recreation and livelihoods are developed through constant collaboration with stakeholders. Recreational and economic activities that use and consume natural resources, and construction work designed to benefit such activities, is carefully steered and, if necessary, restricted. Management impacts are monitored in many ways, with subsequent activities then adapted accordingly to ensure sustainability.

Preserving local heritage by protecting natural and cultural values

Particularly in coastal and marine protected areas, management planning should be based on comprehensive ecosystem approaches with plans following the spirit of Finland's coastal strategy. This

strategy aims to improve the quality of coastal environments and increase the viability of coastal regions, ensuring that they have good conditions for residential, economic and recreational uses.

Many of the most valuable biotopes in coastal and marine environments have long been shaped by human activity. Their preservation depends on the survival of traditional land uses and cultures. Metsähallitus and local actors must together find solutions that can ensure the future of local livelihoods as well as natural and cultural environments. Complex land ownership patterns and the great diversity of actors make collaboration quite challenging. Taking a wider provincial region as a planning area enables planners to assess opportunities to develop nature tourism and recreational uses in sustainable ways with regard to natural and cultural environments. The NHS is developing management planning and implementation practices for marine protected areas based on the ecosystem approach in cooperation with actors from other countries around the Baltic Sea.

Management of both natural and cultural heritage in protected areas is part of the NHS nature conservation core process. Information about biotopes, species, cultural, historical and landscape values and ancient relics is compiled in data systems where it can be used as a common basis for planning. The combined and comprehensive management planning of whole environments and all their valuable features leads to the best possible results, as can be seen in the example of the herb-rich forests of Harola (see Information Box 21, p. 202). In Southern Finland the combined management of traditional agricultural biotopes and built cultural environments often results in valuable synergies.

In Northern Finland reindeer husbandry only accounts for a small proportion of rural livelihoods and the regional economy, but its ecological and cultural significance are still great. The reindeer husbandry region covers about a third of Finland, and natural conditions in this region are highly sensitive. Reindeer herding and other nature-based livelihoods are very traditional activities which are closely linked to cultural identity. The sustainability of reindeer husbandry is dependent on ecological, economic and socio-cultural balances that can be very challenging to achieve.

The quantity and quality of lichen pastures have largely regulated the maximum numbers of reindeer allowed to graze in natural pastures in each reindeer herding district. These pastures must remain in at least moderate condition for reindeer herding based on natural pastures to remain viable. Efforts should be made to enhance sustainability by controlling reindeer numbers and improving pasture rotation systems. The overgrazing of natural pastures reduces the economic viability of reindeer husbandry, as the need to provide extra fodder increases. On the other hand, providing fodder can help to reduce dependency on natural conditions and increase the stability of production.

The continuation of livelihoods related to reindeer is vital for socio-cultural sustainability in the north, in that it helps to keep rural settlements and the culture of the indigenous Sámi alive. The total number of reindeer-owners has fallen by more than 20% over the last decade, and the average age of herders has risen considerably. Their main source of income is meat, but tourism related to reindeer has become more important in the regional economy, providing income for herders and a cultural attraction for the region.

The Sámi culture's close links to nature, traditional livelihoods and local communities mean it is very much tied to localities. The management, use and conservation of the natural resources of lands administered by Metsähallitus are conciliated in ways that can ensure the survival of Sámi culture. The Sámi Parliament in Finland, in its approval of the Sámi sustainable development programme in 2006, called for changes in the Act on Metsähallitus to exclude State lands in the Sámi Homeland region from statutory production requirements set for the Forestry business. The Sámi Parliament believes that reindeer herding can only be practised on a sustainable basis, if its special land use requirements are safeguarded. It also holds that other forms of land use, such as logging, tourism, mining and mechanical gold prospecting, are not compatible with reindeer grazing. Protected areas provide reindeer with extensive undisturbed winter pastures. Activities that would threaten natural and cultural values are not permitted, and the needs of reindeer husbandry are widely considered. Efforts are made to develop any tourism related to the Sámi culture in ways that are acceptable to the Sámi.

Concentrating nature tourism to maximise benefits and minimise harm

Protected areas are major attractions for nature tourism, and thus important for regional economies. Metsähallitus's areas in marine and inland waters and their facilities form a nationally important network, whose significance is increasing as more and more shores are developed for construction. The ageing, urbanisation and internationalisation of the population affect NHS activities as the demand increases for safe and high-quality facilities for various customer groups. The increasing use of areas together with new threats, such as climate change and harmful invasive species, represent a growing challenge to the sustainable management of protected areas.

The NHS aims to integrate nature recreation, nature tourism, landscape management and the use and conservation of natural resources in a sustainable way, for instance, by implementing the VILMAT Action Plan in line with changing demand and Metsähallitus's own development programmes. Increases and improvements in services will be largely channeled into existing recognised focus areas for nature tourism and recreation. Developments will be directed to areas where the demand is greatest and where the most significant impacts can be induced in local employment and economies. Collaboration with the tourism sector will be increased, aiming to develop customer service entities. Trends in the numbers of visits to areas are regularly monitored.

In 2006 Metsähallitus updated its nature tourism development objectives for protected areas for the period 2007-2015 together with the related funding needs. The updated objectives cover 47 specific areas, of which 13 are identified focus areas for the development of tourism. The latest forecasts indicate that total annual numbers of visits to protected areas will rise by more than 40% from 4.4 million visits in 2005 to 6.3 million in 2015. This amounts to an annual increase of about 3.5%. The most popular focus areas already receive 90% of all visits and are also expected to attract 90% of the increase in the number of visits.

By steering tourism into focus areas Metsähallitus aims to direct impacts on biodiversity into areas, where such pressures already exist, and where impacts can be monitored and controlled.



Nature on Helsinki's doorstep in the Nuuksio National Park. More than 500,000 visits to the Nuuksio area are made annually, one fifth of them to the national park. A new visitor centre will soon be built adjacent to the park to help visitors appreciate the diverse nature of Nuuksio and other Finnish protected areas. Photo: Mauri Leivo.

During the management planning of protected areas, recreational activities are channeled into zones where larger numbers of visitors do not significantly harm natural or cultural values. The aim is to create a sustainable network of routes that considers natural sites and, in the north, also the needs of traditional livelihoods. Special attention is given to the need to channel the leisure use of snowmobiles onto designated routes.

Biodiversity and local cultures are considered across Finland according to principles defined for sustainable nature tourism wherever nature recreation and tourism developments are planned. In focus areas the ecological and socio-economic impacts of nature tourism are monitored systematically using standardised methods. Changes in the statuses of indicator species and the vegetation are monitored continuously, and visitor and customer surveys are also conducted regularly. The resultant information is used in the planning of management and restoration work, and in the development of facilities. The NHS's own visitor surveys are to be further improved and socio-economic research will be conducted in collaboration with the Finnish Forest Research Institute and universities.

Sustainable management of game grounds and fishing waters

Finland has diverse stocks of game animals, game birds and exploitable fish species. More than half of Finland's mammal species and more than a tenth of Finland's bird species may be hunted. About a third of the country's fish species are found in catches by professional or amateur fishers.

With the exception of elk, the viability and reproductive capacity of most game species are more affected by the quantity and quality of their habitats than by hunting. In addition to fishing pressure and water quality, fish stocks are affected by many other local factors. Game and fish stocks and their habitats are managed throughout Finland with the aim of ensuring that they can be sustainably exploited on a continuous basis. Game and fish populations in protected areas usually form part of the stocks of wider areas, and their management should therefore be planned from this wider perspective.

Metsähallitus's principles for the management of nature and wilderness reserves, updated in 2007, include principles covering the regulation

of hunting and fishing in protected areas. Management arrangements and control measures aim to ensure that protected areas' nature conservation objectives can be achieved. Key objectives include the survival of viable populations of species and the preservation of the natural state of habitats. Maintaining the favourable conservation statuses of populations is a common objective from the perspectives of both hunting and conservation. The preservation of animal populations in smaller protected areas is in practice more dependent on the habitats and stocks of game animals in surrounding areas than on the regulations defined for protected areas.

In the future, hunting and fishing policies must be planned comprehensively on a larger spatial scale, just like other uses of land and water resources. The aim for Metsähallitus's game and fisheries planners is to work with conservation biologists, other planners and key stakeholders to resolve hunting issues in ways that satisfy all parties. In the management plan for Salamajärvi National Park and other nearby protected areas, for example, hunting issues have been resolved on the basis of assessments covering the whole planning area.

Hunting does not need to be allowed in all protected areas, even where legislation permits this. Protected areas may serve as game preserves in the vicinity of hunting areas. Hunting prohibitions and restrictions are planned giving consideration to both conservation objectives and the need to manage and regulate game stocks. Flexible solutions may also be sought. In areas established to protect birds, it is justifiable to ban the hunting of waterfowl, but under suitable circumstances the hunting of elk, deer and small predatory mammals may be permissible. Where necessary, seasonal restrictions may be applied to protect birds on migration, for instance. The eradication of small predators, particularly alien species, from nature reserves is a common objective of the NHS. The purposeful management of game stocks in collaboration with local hunters and their associations is becoming more important than ever. Game stocks may be controlled through hunting permits and agreements or stock management agreements according to the regulations and objectives defined for the protected areas in question.

Over the next few years the NHS will gain access to new tools that will enable both more accurate estimates of the state of game and fish stocks in protected areas, and the monitoring of their exploitation. Through joint planning with the Finnish Game and Fisheries Research Institute game survey triangles and waterfowl monitoring sites will be set up in protected areas, and the monitoring of game birds' courtship display sites will be intensified. Differentiated monitoring of catches will also be developed for protected areas and the parts of Northern Finland, where local residents have free hunting rights. A fishing water monitoring system is also being set up, to enable the monitoring of management measures, fishing quotas, permit sales, and catches for each river basin. This will also help to keep State of the Parks reporting up to date with species data for protected areas and other information on the state of fish and game stocks and catches. This information can also help basic research, including comparative studies of the species assemblages of protected areas and commercially exploited areas.

10.4 Sufficient Resources Vital for Effective Protected Area Management

One of the targets of the CBD's programme of work on protected areas is that sufficient financial, technical and other resources, to meet the costs of effectively implementing and managing national and regional systems of protected areas, should be secured by 2008. The funding allocated for the acquisition and management of nature reserves in Finland is described in Sections 4.2.2 (Fig. 11, p. 45) and 8.3 (Fig. 49, p. 166). By international standards these funding levels can be described as at least satisfactory, but as the network of protected areas grows, the sufficiency of resources is becoming a critical factor.

Over the last few years the NHS has become responsible for a steadily increasing number of areas and related tasks. In spite of this expansion and continuously rising costs, no corresponding increases or revisions have been made in the basic funding for the NHS. The overall level of funding has risen due to the transfer of tasks and personnel to the NHS from other units and

agencies. The concentration of protected areas and the related tasks under the NHS has enabled improvements in effectiveness and overall productivity. Performance targets have been well met.

Most of the NHS's funding comes from the Government budget through the Ministry of the Environment and the Ministry of Agriculture and Forestry. Employment funding has contributed greatly to the work of NHS Ostrobothnia and NHS Lapland, but its significance may shrink over the coming years. Work related to hunting and fishing will continue to be funded through income from the sale of permits, assuming that sales remain at present levels.

A significant proportion of NHS's current funding comes from project finances. It has been possible to increase such project financing in recent years, especially in relation to support obtained from EU funding programmes over the funding period 2000-2006. Following the expansion of the EU, the competition for project funds will become tougher during the next funding period 2007-2013. The new environmental funding instrument LIFE+ differs from previous programmes in that member states may present their own views of the national significance and suitable priorities of the projects, even though decisions on the allocation of funding will continue to be made by the Commission. During the new funding period changes may be made in the EU's other funding systems, including the allocation of structural funds, with consequences at national level.

The new organization of the NHS focuses on development work, the administration of project funding, and efficiency improvements in project implementation. Involvement in new partnerships, such as joint research projects, can help the NHS to obtain funds from new sources.

10.4.1 Inputs Needed for the Establishment and Planning of New Areas

Acquisitions of land for current nature conservation programmes will be completed by 2009 through an existing funding programme. Over the next few years legislation will need to be enacted to establish about 1,000 new nature reserves. Approximately 2,000 nature reserve cadastral units should be established or expanded. An estimated 8,000 km of boundaries between protected areas and commercially managed forests will have to be demarcated.

The preparation of legislation and the formation of nature reserve cadastral units are laborious and expensive processes. It is therefore vital to carry out such work systematically and effectively. Well coordinated collaboration with the environmental administration and the National Land Survey of Finland can facilitate such work and reduce costs. But these tasks are still imposing, and additional funding and sufficient personnel resources will be required. The actions taken to establish protected areas are of prime importance for their future administration and management.

Management plans will need to be drafted for some 200 State owned protected areas over the next few years. Even though combined plans can be drafted for groups of areas, the task ahead is still enormous. Basic data is needed for all of these areas on their biotopes, species, cultural sites, facilities, recreational uses and economic uses. Regulations additionally need to be drawn up or revised for more than a hundred areas. The target of drafting management plans for 30 Natura sites a year can only be met with the help of great inputs from all of the core processes (protected area management planning, nature conservation, recreation, and game and fisheries). A programme of work for the period 2008-2010 will help the organisation of these tasks.

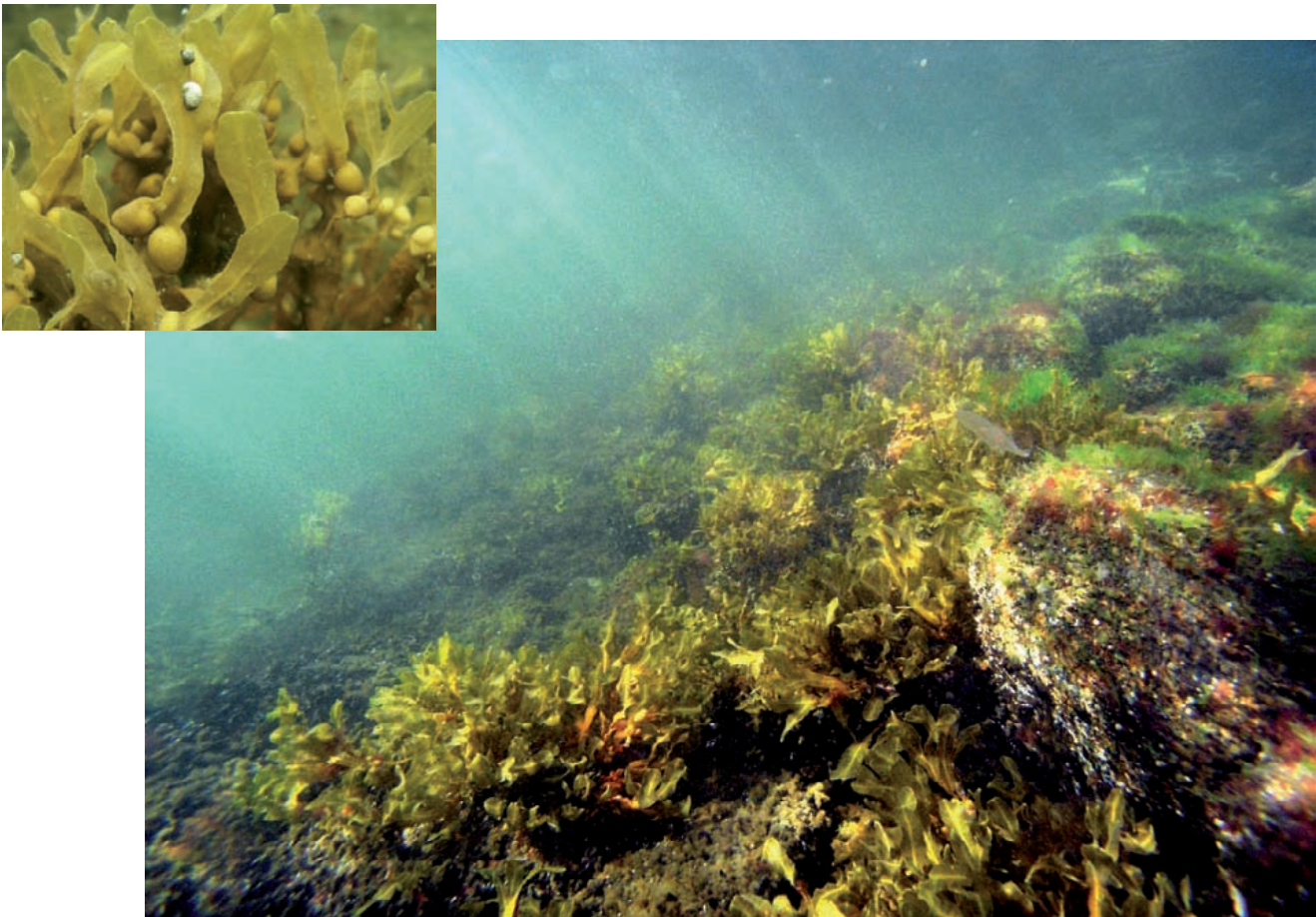
10.4.2 Continuing Support for National Programmes of Work

Over the years 2003-2006, considerable resources have been invested in three major programmes – the METSO Forest Biodiversity Programme for Southern Finland; the Finnish Inventory Programme for Underwater Marine Environments (VELMU); and the VILMAT Action Plan to Develop Nature Tourism and the Recreational Use of Natural Areas – with significant results. It has particularly been possible for the NHS to effectively reach objectives set in the METSO Programme, using separate funding. By the end of 2006 biotopes had been inventoried in most of the protected areas within the METSO region. Forest and mire habitats, with a total extent of 14,500 hectares, have been ecologically restored. The first phase of the METSO Programme has been completed. During 2007 a new programme

of action and funding for forest biodiversity is being prepared under the supervision of the Ministry of the Environment for the period 2008-2016.

Work on the VELMU inventory of underwater biotopes is still in its early stages, but the necessary methods and cooperative networks have already been developed with the help of project funding. Preliminary targets and schedules have been set up to 2014.

The VILMAT Action Plan has helped to direct investments and work into the development of focus areas for tourism, while boosting local employment and enhancing research and monitoring related to impacts on regional economies. Employment targets have been set for 2010 and forecasts of increases in the visitor numbers have been made for focus areas as far ahead as 2015.



A bladder wrack (*Fucus vesiculosus*) community in the well-lit waters of a rocky seashore. Along with blue mussel and eel grass the bladder wrack is one of the key species of the northern Baltic Sea. In good conditions growths of this seaweed form a uniform zone at a depth of 0.5-5 metres, offering shelter and food to a variety of sea creatures. Bladder wrack communities have declined considerably due to smothering by the filamentous algae that have proliferated due to the eutrophication of the Baltic's coastal waters. Photo: Metsähallitus.

Apart from the goals set in the programmes themselves, ensuring the successful continuation of all three of these national programmes is essential also in reaching the wider objectives of Finland's National Action Plan for Biodiversity and the 2010 targets.

10.4.3 Productivity Improvements and Effective Cooperation

Productivity improvements are sought in all NHS activities under the environmental administration's productivity programme and its own specified programme for 2015. Ways to achieve the necessary improvements include the reallocation of resources, the standardisation and enhancement of procedures, and the continuous development of data management to support activities. In spite of productivity improvements it will be important to preserve sufficient staffing levels to ensure performance targets can be met. It is also important to look after the motivation, capabilities and know-how of personnel. This will be done through the personnel strategy, which was finalised in 2006.

National legislation and nature conservation administration are being developed to increase effectiveness and productivity in the environmental sector. Productivity can be improved by clarifying the internal allocation of responsibility within the administration, and by strengthening cooperation.

The NHS has improved management planning procedures by organizing the core processes to produce their own parts of the plans in parallel. Guidelines for planning were updated in 2006. An action plan is being drawn up for the conservation of species and biotopes, aiming to focus on the most urgently needed measures. Habitat restoration and management measures are being continuously improved, and the cost-effectiveness of measures is monitored. A strategy for the conservation of cultural heritage has been drafted, and work has commenced on an action plan aiming to ensure that limited resources are used effectively. Facilities for the recreational use of nature will particularly be developed in identified focus areas for tourism, to ensure sustainability and cost-effectiveness.

Cooperation and partnerships will become more important, especially in the local and regional planning of protected area networks, in the management of natural and cultural sites, in the restoration and maintenance of habitats, in the promotion of tourism based on protected areas, and in research and monitoring related to regional impacts.

Finland is obliged to maintain its own share of the biodiversity of the boreal coniferous forest zone. To succeed in this task, it is important to cooperate with neighbouring countries to conserve biodiversity in neighbouring regions. Finland has been actively collaborating on nature conservation with Russia in particular. Some of the old-growth forests inside NW Russia, near the Finnish border, face increasing pressure for the exploitation of their timber, also because of the demands of Finland's forest industry for timber imports. Ways must be found to preserve biodiversity and ensure the sustainable use of natural resources through national and international actions. Cooperation between protected areas in the border region particularly promotes the conservation of the Green Belt of Fennoscandia (see Fig. 57, p. 215) The NHS has also collaborated closely with protected areas in Northern Norway, the High Coast of Sweden and Estonia. The continuity of these activities must be ensured.

10.5 Knowledge Base to be Further Strengthened

Cost-efficient and adaptive policies for the conservation and sustainable use of biodiversity need to be based on solid basic data on protected areas and sites and other background data obtained through research. For decision-makers, local residents and other stakeholders to support and approve of actions, they must be made aware of the nature of management actions and their impacts, and also be able to make their opinions heard on protective measures and the use of areas. The work of the nature conservation administration must be backed up with purposeful and effective information management, and open and easily comprehensible communications.

10.5.1 Developing State of the Parks Monitoring

After the completion of this first State of the Parks report, an assessment will be made to find out how all areas administered by Metsähallitus, and later also possibly areas under other administration, can be brought into the scope of state of the parks monitoring. Monitoring of the state of protected areas and assessments of changes must be improved over the coming years by further developing data management. Basic data on protected areas and monitoring data on the effectiveness and sustainability of operations should be further standardised and the management of this information made much easier.

Improving the management of data on protected areas

The Nature Conservation Act obliges the authorities to maintain a data system covering nature reserves, their valuable natural features, and all decisions made in relation to these areas. Today such information is stored in many different forms in the data systems of various authorities, and it is not always accessible to everyone who might need it. Data on the establishment, location, administration, natural features and other characteristics of protected areas needs to be available in more standardised, up-to-date and user-friendly form for the benefit of all the authorities responsible for nature conservation. Such data may also be needed by other actors in Finland for land use planning, for instance, and for international purposes including reporting on protected areas.

The nature conservation administration has been running a project to develop the management of data on protected areas (SALTI). One long-term solution within the proposals for future development concerns the creation of a single joint database on protected areas for the use of the whole nature conservation administration. This database and its related applications would form the core of information management work within the nature conservation administration. The database could also encompass data on the effectiveness and impacts of protected area management. Long-term objectives will also include the development of a web-based information

service, which would exploit data from the new joint database and other sources. This service could be used for enquiries and searches, and also to compile reports including data on all of the protected areas for which the nature conservation authorities are responsible (nature reserves as defined in the Nature Conservation Act, including areas under State or private ownership that are already established or designated in plans or programmes; sites within the Natura 2000 network; and wilderness reserves). This extension and standardisation of the nature conservation administration's whole information system is a sizeable task that will take many years and require considerable resources to implement.

The fulfilment of NHS tasks in practice requires sufficient basic data resources on protected areas, but the data resources are still incomplete. Table 21 on p. 173 examines the current availability of basic data of different types of protected areas. At the moment, there is a lack of accurate biotope data from extensive protected areas in Northern Finland that could be comparable with the rest of the country (since current information is largely based on biotope surveys conducted in Lapland through the interpretation of aerial photographs before data on biotopes began to be collected more systematically in recent years). There is also insufficient data on aquatic marine environments and a shortage of standardised basic data on important species.

The first round of biotope inventories of protected areas will be completed in with new funding for the METSO Programme and supplementary budget funds. Inventories of marine areas will continue through the VELMU Programme. Inventories of aquatic habitats in inland waters in Metsähallitus areas are due to commence in 2009. Inventories and valuations of cultural heritage in protected areas have begun in 2007 and will continue until at least 2012. As national data resources are accumulated on protected areas' biological, geological and cultural values, this information must be made available to Metsähallitus and other parties responsible for managing protected areas. Sufficient basic data is also needed to enable adaptation to the impacts of climate change and harmful invasive species.

Improvements in data systems and information management and increases in the coverage of data resources will, in the coming years, greatly

enhance state of the parks monitoring at every level, from individual protected areas through wider regional networks to the whole protected area system. So far it has only been possible to record data for individual protected areas on separate forms, which are now published in electronic format together with relevant maps. At a later stage it is hoped that the contents of information systems will become comprehensive enough that it will be possible to obtain up-to-date information on specific protected areas whenever necessary. In printed form such information can still be used to make more conventional park profiles.

The immediate objective over the next few years is to compile at least basic information (as in part 1 of the park profiles, see Appendix 5) for all established protected areas administered by Metsähallitus. This type of basic data has previously been compiled whenever management plans have been drafted, but such plans are not considered necessary for some areas, especially smaller areas whose known natural values are not under any evident threat. In the future the state of such areas can be monitored, for instance, with the help of "park cards", if data collected in the field is updated in data systems.

Management effectiveness monitored continuously

One of the targets of the CBD's programme of work on protected areas was to evaluate the capacities of the organisations responsible for managing protected areas by 2006. Another target concerns the development of methods, standards, criteria and indicators for monitoring and assessing management effectiveness in the longer term at different levels. Development work is required to standardise and improve the effectiveness of operations by 2008. In 2004 a management effectiveness evaluation (MEE) was conducted of Finland's protected areas by an international team. An organisational restructuring and other significant changes have been implemented on the basis of the evaluators' recommendations, to enhance and standardise the work of the NHS. This State of the Parks in Finland report is the first in a series of regular reports.

The programme of work on protected areas aims to ensure that by 2010 the monitoring,

evaluation and reporting of protected area management are conducted as widely as possible. It is hoped that by 2010 management effectiveness will have been evaluated for about 30% of protected areas. In Finland this would mean coverage of about 600 areas established or designated under conservation programmes in State land, or a total area of 1.2 million hectares (12,000 km²). So far management effectiveness has only been evaluated for 70 areas, but these areas together have a total extent of 2.7 million hectares, which corresponds to about 65% of the total extent of Finland's protected areas.

Systematic data on individual areas, which would reveal the effectiveness of management at park level, has not been collected by the NHS so far, even though figures are compiled for indicators and performance measures quite comprehensively on an annual basis. The implementation of management plans is monitored at a general level and using area-specific performance measures which may vary considerably. At least where national parks are concerned, it might be necessary to develop indicators to describe the effectiveness of the management of individual areas more systematically and consistently. This would serve both state of the parks monitoring at national level, and international reporting.

The next international evaluation of the management of Finland's protected area network as a whole is scheduled for 2014. By this date actions should have been taken to harmonise reporting procedures related to international biodiversity conventions and their programmes of work. It is also important to keep track of improvements in the methods that can be used to evaluate management effectiveness, as well as evaluation results. Finland's experiences of such monitoring and evaluation work can also be beneficially shared with other countries. Experiences have already been shared with protected area authorities in the Baltic countries, for instance.

10.5.2 New Tools Needed for Monitoring and Assessing Effectiveness

The implementation of the CBD's programme of work on protected areas and the biodiversity targets for 2010 is monitored through selected indicators. Common indicators are developed through cooperation between parties to the CBD,

and these may be supplemented by nationally devised indicators and performance measures.

Provisional indicators defined for use in the context of the CBD's 2010 targets include:

- the extents of ecosystems and habitats
- trends in the coverage of protected areas
- trends in the abundance and distribution of selected species
- change in the status of threatened species
- trends in invasive alien species populations
- water quality of freshwater ecosystems and the ecological state of the seas
- connectivity of ecosystems
- trends in linguistic diversity and numbers of speakers of indigenous languages
- official development assistance funds directed towards the implementation of the CBD.

In addition to general indicators, other specific indicators will be needed to describe trends

in biodiversity and the factors affecting them, as well as the ecological and socio-economic impacts of the use of natural resources and protected areas. Such indicators can create a clearer picture of causal relationships, and also show where and how work should be (re)directed to achieve the desired goals.

Developing indicators for biodiversity

The main goals of Finland's national biodiversity action plan for 2007-2016 are to halt the loss of biodiversity in Finland by 2010 and to establish favourable trends in the state of the natural environment in Finland over the period 2010-2016. A biodiversity monitoring system is needed together with suitable indicators to monitor progress.

A system for monitoring the state of biodiversity in Finland is under construction. It is largely based on existing species and biotope monitoring schemes run by various research institutes. Notable schemes include the Finnish Forest Research



The Siberian jay (*Perisoreus infaustus*) is an indicator species of old-growth boreal taiga forests. This sociable bird is threatened in Europe. Finland has special responsibility for its survival, since over 10% of its European population nests here. Photo: Markus Varesvuo.

Institute's national forest inventory, The Finnish Game and Fisheries Research Institute's game triangle surveys, and the monitoring of breeding bird populations by the Finnish Museum of Natural History. A considerable part of the information used for biodiversity monitoring today is provided by amateur volunteers. From the extensive monitoring material it is possible to produce a representative set of indicators of the state of biodiversity in Finland.

The evaluation of Finland's previous biodiversity action plan sought to identify indicators of the typical pressures, states and responses for each main habitat type according to the DPSIR framework (see Fig. 3, p. 24), to make assessments of the factors affecting the state of habitats and species diversity, and the impacts of the action plan's measures on such trends. A total of 75 habitat-specific indicators were defined, giving due consideration to the availability of the necessary statistical, monitoring or research data.

Indicators for monitoring biodiversity in Finland are being developed under the coordination of the Finnish Environment Institute through national and international cooperation. A proposal for an expanded set of indicators published in 2006 is presented in Appendix 21. The proposal includes a couple of dozen new indicators of state and impacts based on species monitoring, as well as several new landscape-level indicators and indicators for pressures and the impacts of responses. Many indicators still need to be developed, since the proposal does not include details of parameters or the ways data should be collected.

In addition to existing monitoring indicators there is a need to identify species or species groups whose trends would be indicative of changes in important habitats for threatened species, or of trends induced by climate change, or the spread of alien species. Certain vascular plant, moss, beetle, and polypore fungus species are already used as indicators of trends in their habitat, for instance in surveys of natural values in forests. Of particular importance to the NHS are state indicators related to species for which Metsähallitus has special responsibility, and response indicators used to illustrate the impacts of habitat restoration and management measures.



Bird-watching from a platform in the Siikalahti Nature Reserve. Observing nature close at hand can inspire young people to get more interested in conservation issues. Metsähallitus's customer service points, websites and brochures offer plenty of information on the protected sites and their plentiful plant and animal life. Photo: Jouni Koskela.

Indicators of socio-economic benefits

One of the targets set for the CBD's programme of work on protected areas for 2008 is to significantly increase public awareness of the importance and benefits of protected areas, also in schools. Reporting is one way to increase awareness. This report aims to give an overall picture of Finland's protected areas and the role they play in nature conservation and the preservation of biodiversity in Northern Europe. It also seeks to highlight the part protected areas play in conserving and maintaining the viability of Finland's cultural heritage, and to stress the growing importance of nature tourism and the employment it generates to local and regional economies. Information on changes in the state of the parks and their role in maintaining biodiversity and supporting sustainable regional economies will continue to be provided, in the interim before the next state of the parks report, for various target groups – decision-makers, stakeholders, researchers, the media and the wider public – through such channels as annual reports and Metsähallitus's websites.

In the future new ways will also be needed to describe the impacts of nature conservation and the use of natural resources. New means will also be needed to measure how conservation work is understood and perceived, and to illustrate the benefits to well-being that nature and nature reserves can offer.

Another challenge concerns the need to publicise nature conservation and the use of protected areas in a way that would make more understandable:

- the importance of conserving biodiversity (i.e. species and their habitats)
- the concept of ecosystem services, which illustrates how the well-being of nature is vital for the well-being of people
- the overall functioning of ecosystems, and why protected areas need to be expanded and the conservation network as a whole must be complemented
- the preservation of cultural environments as a whole, and why they need to be managed
- the benefits of nature tourism, and its impacts at protected area, local and regional level
- benefits in terms of the well-being of individuals and communities.

Protected area management aims to preserve biodiversity and increase human well-being. Figure 60 illustrates protected area management and its impacts in the context of the ecological and socio-economic operating environment. The different-coloured quartered squares depict balanced scorecards representing the management performance of protected area administrations operating under different circumstances (see Fig.

44, p. 153). The state of the environment, levels of socio-economic stability, and the amounts of resources available to a park administration, all fundamentally affect the scope for activities to generate positive impacts. The approval and support of society as a whole can only be gained, if conservation work is widely understood, and the social benefits of protected areas can be demonstrated.

10.6 State of the Parks Reporting in 2010

The targets set for 2010 to create a comprehensive, ecologically representative and well-managed protected areas system, and to halt the ongoing decline in biodiversity are both highly ambitious. Challenges concern not only the implementation of measures towards these goals, but also the monitoring of changes in the operating environment and on the state of biodiversity as well as assessing effects of measures already taken.

Finland's national biodiversity evaluations were praised at the 8th Conference of Parties (COP8) to the CBD, which was held in Brazil in spring 2006. COP8 attempted to examine how signatory countries have made progress towards their common goal to significantly reduce the rate of biodiversity loss by 2010. However, there is not yet any detailed picture of biodiversity loss at global level. One related problem is the

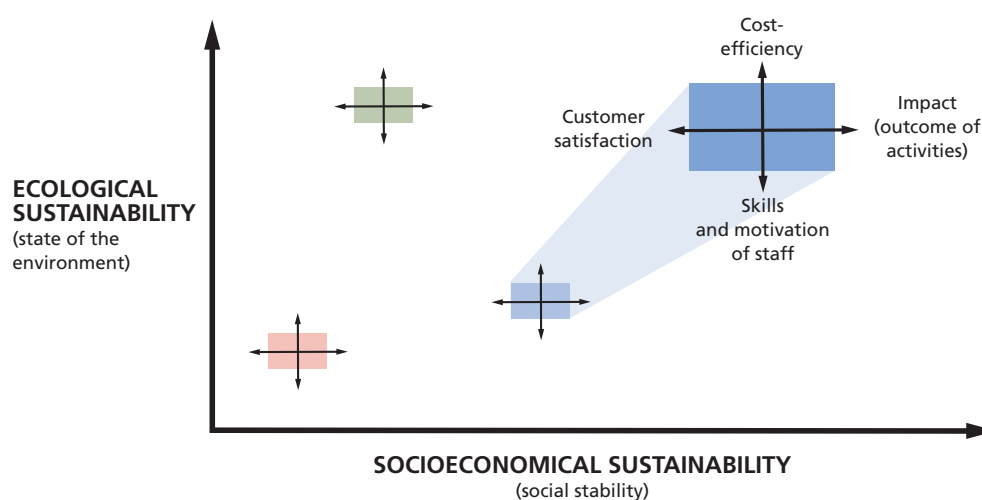


Figure 60. Management of protected areas and its effectiveness in relation to developments in the operational context. The fundamental objectives of nature conservation are to improve the ecological state of the environment and ultimately to enhance the stability of society. Success requires financial continuity, the motivation of staff, and cost-efficient work leading to measurable positive impacts on biodiversity and human well-being. Source: Metsähallitus.

lack of monitoring data. Only a few countries have conducted extensive evaluations of their environmental policies from the perspective of biodiversity. Less than a third of the signatory countries have reported on their implementation of the convention as agreed. Finland submitted its third country report to the Convention Secretariat in summer 2005. The next report is due to be drafted in 2009; this information will be compiled for the COP10 meeting, which is scheduled for spring 2010.

The state of the environment and biodiversity in Finland is better known than in most other countries, and monitoring tools are being continuously improved. Overviews of biodiversity and nature conservation produced at national level, like this State of the Parks report, are possible thanks to the possibility to exploit data compiled by various actors. A still clearer picture will be produced when new research and monitoring data becomes available. The next review of the State of the Parks in Finland will be compiled in 2010. Reporting will be conducted applying the same management effectiveness evaluation framework and adaptive management model used in preparing this first State of the Parks report.

The key indicators and performance measures used in this report, and envisaged for subsequent use (Appendix 22), form a basis for monitoring trends in the protected area network, conservation of biodiversity and the management of protected areas. The structure and information content of the next report in 2010 will be considerably more condensed, however. In the second report it will no longer be necessary to present such a wide description of the operating environment or examine pressures and threats in such detail. Descriptions of cultural heritage and the strategic foundations for NHS operations may also be more limited.

By 2010 the knowledge base for assessments of both individual protected areas and the whole protected area network will probably be much more comprehensive than they are today. Improvements in the management of information on protected areas and the usability of data systems can be expected to facilitate the use of extensive data resources and the presentation of comparisons in condensed numerical form. The information previously collected for 70 protected areas on separate forms will in the future become available in the form of overviews or standardised printouts obtainable directly from data systems.

One special focus of the next State of the Parks report is likely to be Finland's threatened species. Data compiled in connection with the reporting required under the Habitats Directive for the period 2001-2006 about the conservation statuses of directive-listed species and habitats in Finland will then be available. The next Red List assessment of the country's threatened species is also due to be finalised in 2010. More will also soon be known about Finland's threatened biotopes and the related need for conservation, since a national evaluation is due to be completed by the end of 2007, allowing its results to be used to draw conclusions on the necessary conservation measures. The methods used to monitor and assess the social impacts of protected areas are improving, and research findings are also expected on issues including the impacts of the measures taken to develop nature tourism on regional economies and employment.

Reporting on the state of protected areas and work towards the biodiversity targets for 2010 will provide more detailed information than ever before on:

- the state of biodiversity in Finland
- the role of the protected area network in preserving biodiversity
- benefits that protected areas provide for people and local communities.

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