YMPÄRISTÖMINISTERIÖ
MILJÖMINISTERIET
MINISTRY OF THE ENVIRONMENT

Date

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Submission of Finland's fourth national report to the Convention on Biological Diversity in accordance with decision VIII/14 of the Conference of Parties (notifications 2006-083 and 2008-052).

This report to the CBD by Finland indicates a relatively strong commitment of all sectors and stakeholders to the implementation of the Convention on Biological Diversity (CBD). The assessment of the status of and current trends in biodiversity in Finland reveals a mixed picture, however. The 4th national report is based on nearly 100 habitat-specific indicators that reflect not only the state of biodiversity, but also the pressures put on biodiversity and the actions taken in response to these. The overall development of the indicators and reporting of the trends have been evaluated in a similar fashion as those in the Millennium Ecosystem Assessment (2005).

The impacts of climate change on biodiversity are of high importance for a northern hemisphere country with subarctic fell ecosystems. Some of these impacts have been evaluated in this report, yet further attention needs to be focused on this question in the future.

The global-level commitments and efforts to strengthen the implementation of the CBD have to be realized on both national and regional levels. National Biodiversity Strategies and Action Plans are therefore of highest importance. The National Action Plan for Biodiversity in Finland for 2006–2016 builds on our agreed actions to implement the CBD together with different stakeholders through our National Biodiversity Monitoring Group.

We need evidence of the adequate positive effects of the actions on biological diversity. The mainstreaming of biodiversity into different policy sectors is crucial for reaching our common goal. It is very hard to believe that the 2010 target can be reached without adjusting national and regional actions and performance according to the target. It is clear that more needs to be done to reach the 2010 target for halting the loss of biodiversity. Without a doubt, scientific assessments are of vital importance when adjusting actions for achieving our common goal.

The Convention has not yet received enough public or political recognition. Only by raising public awareness, and with the support of public opinion and the broad participation of all relevant stakeholders in preparing and implementing conservation and sustainable use actions, can we improve our commitment to the sound implementation of the Convention. We must also demonstrate the important role biodiversity can play in opening up new economic opportunities and in the efforts to eradicate poverty.

One of the crucial objectives of our national work is to improve the effective communication of issues related to the conservation and sustainable use of biodiversity.

Finland has launched a new logo "*Biodiversity – Essential to Life*" to illustrate our common commitment to halting the loss of biodiversity. Our logo is found on the cover of this report and will be actively used by different stakeholders up to the year 2010 and beyond.

With high regards,
Yours sincerely,

Minister Paula Lehtomäki
Ministry of the Environment, Finland

Fourth National Report on the Implementation of the Convention on Biological Diversity in Finland

YMPÄRISTÖMINISTERIÖ
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MINISTRY OF THE ENVIRONMENT

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3. Sectoral and cross-sectoral integration or mainstreaming of biodiversity considerations

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EXECUTIVE SUMMARY

An assessment of the status of biodiversity in Finland and current trends reveals a mixed picture.

Certain populations and distributions of wildlife species are showing positive trends, and some species that were once considered to be at risk of extinction are now stabilizing or even increasing. The conservation status of many species and biotopes protected under the Habitats Directive are still under pressure, despite the progress made in implementing the Natura 2000 network. Some species show positive trends, and it is encouraging that large carnivore species and fish species have recovered in Finland. The Birds Directive has clearly helped many bird species to recover. Some 12% of Finland's total surface area is now under protection, either as established protected areas or other areas reserved for nature conservation programmes. If Natura 2000 network sites are included, the total area under protection increases to 15%. The protected areas network is more representative in the north and the east but the there are still particularly a need to improve the ecological network in Southern Finland. Natura 2000 sites have complemented the previously existing network of protected areas, and notably enhanced the protection of marine habitats, which are still inadequately protected overall, however.

Land use practices in Finland are still changing, but not on the same scale as in recent decades. Forest area has decreased slowly since 1990's. In addition, the quality of habitats for biodiversity has deteriorated in certain aspects. New recommendations for forests management practices have been drafted for both private and state-owned forests. Natural resource plans and landscape ecological plans have been produced for all state-owned lands. The planning process has helped to identify and safeguard many valuable biotopes, and also introduced new practices such as the maintenance of connectivity in commercially managed forests. New ambitious goals have been set for the amount of dead wood in both commercially managed and protected state-owned forests. Surveys indicated that the trends in species diversity in forests are mixed. In the latest red-list assessment published in 2000 forests were found to host more endangered species than any other major habitat type.

Threats to biodiversity in Finland include the eutrophication of the Baltic Sea, invasive alien species and climate change. Invasive species pose a risk to biodiversity as their numbers continue to rise. Climate change is evidently affecting more bird species negatively than positively.

Positive trends include reductions in the pollution of inland waters. The improved ecological status of lakes has reduced the pressure on their biodiversity. However, the status of river systems is not as favourable.

Certain agricultural practices are still putting pressure on biodiversity, although policy measures and the spread of organic farming are having positive effects. The main threats to biodiversity in agricultural areas relate to the cessation of traditional farming practices and intensifying land use. Common farmland birds have declined and more than 90% of traditional rural biotopes have been evaluated as threatened.. Progress have been made in relation to soil nutrient balances, for example, which have declined both in case of nitrogen and phosphorus. Still there may be knock-on effects and concurrent reductions in ecosystem services. One issue requiring attention is the potential impacts of bio-energy crops on biodiversity through land use conversion and increasing pressure on semi-natural grasslands.

The National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006-2016 (NBSAP, also entitled 'Saving Nature for People'), which was adopted in May 2006, underlines the importance of conservation and sustainable use of biodiversity, and the fair and equitable sharing of the benefits derived from the use of genetic resources. The detailed Action Plan aims to achieve the goal of halting biodiversity loss by 2010. The recognition of this target has moved biodiversity higher up Finland's political agenda. The evaluation of the National Biodiversity Action Plan 1997-2005 revealed that targeted measures realised through nature conservation legislation have successfully reversed negative trends in some threatened species and habitats.

The Birds and Habitats Directives lie at the core of EU biodiversity policy, and provide the legal basis for the Natura 2000 network of protected areas. Over the last two years many measures have been taken to conserve and restore biodiversity. The Marine Strategy Framework Directive, adopted in June 2008, provides the basis for achieving a good environmental status for the marine environment and an improved conservation status for marine biodiversity. A communication on 'The Role of the Common Fisheries Policy in Implementing an Ecosystem Approach to Marine Management' was adopted in April 2008.

According to the OECD Environmental Performance Review 2009, the integration of biodiversity and nature conservation concerns into national legislation has been strengthened. Finland has ratified most international agreements in the field of biodiversity and nature conservation. There have been positive developments in the protection of species, including migratory species and aquatic wildlife. Management plans have been established for several game species.

Finland's external development assistance related to biodiversity has averaged about EUR 8-10 million a year over the period 2001-2008. Mainstreaming biodiversity into the development cooperation budgets of both donor and recipient countries is a huge challenge. This is partly due to the tendency to limit the number of intervention sectors, which often means that a lower priority is given to environmental issues among other compelling needs. Other factors include difficulties earmarking funds for biodiversity-related work.

Together with the other EU member states Finland has contributed to progress in ongoing negotiations towards an international regime governing access to genetic resources and the fair and equitable sharing of benefits arising from their use. The Multilateral System for Access and Benefit Sharing plays a vital role in implementing the International Treaty of Plant Genetic Resources for Food and Agriculture (IT-PGRFA).

Finland has several strong sectoral research institutes operating under different ministries. Efforts are being directed to increase integration within their research work. For biodiversity research this means more integration with research in other environmental sciences, with research on natural resources and with socio-economic research.

The integration of marine research with other environmental research has also resulted in organizational changes. In the beginning of 2009 the biological and chemical research work of the Finnish Institute of Marine Research was transferred to the Finnish Environmental Institute (SYKE) in order to effectively combine the expertise of these two institutes. SYKE's new Marine Research Centre will study trends in the state of the Baltic Sea, including eutrophication, the ecology and functioning of marine ecosystems, marine biodiversity and invasive species. The Finnish Environment Institute, the Ministry of the Environment and the Finnish Meteorological Institute will continue to collaborate on the running of the Baltic Sea Portal to ensure the availability of comprehensive up-to-date information about the Baltic Sea, current trends, marine research and related projects.

Discussions on the integration of research in the environmental sciences with research on natural resources are evidently leading towards the establishment of an Environmental and Natural Resources Consortium, which would involve as many as 3,000 personnel, including more than 1,000 academic researchers. Such an arrangement has great potential for developing biodiversity research and monitoring in the future.

The Saami are the EU's only indigenous people. Traditional Saami livelihoods related to traditional ecological knowledge include reindeer herding, fishing, hunting and collecting berries. In modern times small-scale tourism has also become important as a livelihood in the Saami homeland region.

The governance structures for biodiversity issues within Finland have been in place since 1995. Regular meetings of the Monitoring Group for the National Action Plan for Biodiversity in Finland evaluate progress on the Finnish NBSAP and the implementation of national legislation related to biodiversity. The results of the evaluation of the Finnish National Biodiversity Action Plan 1997-2005 indicate clear changes towards the better consideration of biodiversity in the routines and policies of many administrative sectors. However, the mechanisms for cooperation between stakeholders on realising the Action Plan should be stepped

up, especially with regard to policy sectors affecting biodiversity such as trade issues, agriculture, forestry and foreign policy including developing aid.

To harness public support for actions to halt biodiversity loss, Finland is considering priority actions for a public communication campaign to be launched in support of the global 2010 biodiversity year. Finland has also been an active partner in the Countdown 2010 initiative and supporting the TEMATEA issue-based modules for the coherent implementation of biodiversity-related conventions.

In 2006 a joint project 'Developing a biodiversity indicator collection for Finland', financed by the Ministry of the Environment was launched to develop a comprehensive set of indicators. This project is coordinated by the Finnish Environment Institute (SYKE) with participation of other governmental research institutes, other organizations and NGOs. The resultant indicator collection should constitute a general platform for presenting the results of biodiversity monitoring in Finland. At EU level more progress has also been made on the SEBI 2010 initiative. A set of 26 pan-European biodiversity indicators will provide the basis for a first European indicator-based assessment of progress towards the 2010 biodiversity target, has been published by the EEA in 2009.

In spite of the progress made on Finland’s NBSAP, it is highly unlikely on the basis of current efforts that the overall goal of halting biodiversity loss in Finland will be achieved. A summary of the progress made in reaching the 2010 can be found in the Conclusions (Chapter 4). To do so, Finland would need to continue to make significant additional commitments and strengthen implementation radically over the next two years. Finland's biodiversity policy framework still needs improving, as important gaps remain related to issues including invasive alien species, urban biodiversity and the impacts of mining. An urgently needed effective legal framework is being drafted to promote the conservation of soil structure and functions, and to protect soil biodiversity. Mainstreaming biodiversity considerations into other sectoral policies remains a key challenge. There is also a need to develop new methods to evaluate ecosystem services with regard to their impacts in different policy sectors. Finland will continue to monitor and assess the implementation of its National Biodiversity Strategy and Action Plan with a view to providing a detailed evaluation in 2010.

Chapter I – Overview of biodiversity status, trends and threats

1.1 Introduction

Since 1997 Finland has had two National Biodiversity Strategies and Action Plans (NBSAPs) in place for the periods 1997–2005 and 2006–2016. Before the approval of present NBSAP the results of the first NBSAP were evaluated by a team of research organizations led by the Finnish Environment Institute (SYKE). While special attention was focused on the specific policies adopted to halt the loss of biodiversity, the evaluation also analyzed the state and development of biodiversity itself and looked at the broader societal forces driving these changes. The results of this evaluation were published in Finnish in 2005 (Hildén et al. 2005) and two years later in English as an extended summary (Auvinen et al. 2007).

The evaluation of first NBSAP for 1997–2005 represented the first time that the state and development of Finland's biodiversity was assessed by using indicators. A total of 75 habitat-specific indicators were developed based on available statistics and monitoring data. This preliminary set of national biodiversity indicators has subsequently been expanded and improved through an on-going co-operation project involving governmental research institutes and organizations and environmental NGOs. As a result of this project a beta-version of a website containing approximately 130 habitat-specific biodiversity indicators has been published on the Internet at www.biodiversity.fi. This Fourth National Report on the Implementation of the CBD in Finland is based on those indicators.

At present, the national biodiversity indicator collection at Biodiversity.fi remains a research and development project. Since 2006 the project has received funding from the national Environmental Cluster Programme, which is coordinated by the Ministry of the Environment and financed by four different ministries together with the Academy of Finland and the national technology agency Tekes. The compilation of biodiversity indicators has been overseen by a steering group including members from the Ministry of Agriculture and Forestry and the Ministry of the Environment as well as from several research institutes operating under these ministries. So far some 200 experts have been involved in the development of the individual indicators included in Biodiversity.fi. Habitat-specific expert groups have also been established to assist in the interpretation of indicators concerning forest habitats, Baltic marine habitats and farmland habitats: http://www.biodiversity.fi/en/about/expert-groups.

1.2 Biodiversity indicators

In this report we have been able to utilise nearly 80% of the planned 130 habitat-specific indicators. In addition to the unfinished habitat-specific indicators, further development work is needed in the case of indicators on climate change and invasive species, which will be added to the collection during 2009–2010. The Biodiversity.fi website will thus be enhanced through constant development work until the end of 2010.

This report refers to the national indicator collection as Biodiversity.fi. The links in the names of each indicator lead the reader to front pages for the indicators in question. Links from each indicator at Biodiversity.fi lead to background information pages which include the data collected for each indicator as well as links and references to further sources of information.

As a result of the Streamlining European Biodiversity Indicators 2010 (SEBI2010) process a proposal for a first set of indicators to monitor progress towards the 2010 target in Europe was published in 2007.This proposal includes 26 indicators ranging from trends in the abundance of selected bird and butterfly species to ecological footprint and public awareness. Most of the topics covered by these indicators are also covered by the Finnish indicator collection. In many cases, however, the Finnish indicator collection is somewhat more detailed due to the habitat-wise approach applied (Chapters 1 and 2).

1.2.1 DPSIR framework and habitat approach

All of the national biodiversity indicators have been classified according to the widely used DPSIR framework (Table 1). This framework helps to steer analyses towards the more balanced evaluation of the many factors involved in changes in biodiversity. It also enables a more concrete understanding of the causal links between different indicators. The somewhat ambivalent distinction between state and impact indicators has been made in this case based on the abundance of phenomena: parameters on general habitat qualities and common species have been classified as state indicators, while indicators related to more uncommon species and habitats such as those that have been red-listed or included in the EU Habitats and Birds Directives have been interpreted as impact indicators. No indicators have been included in the collection so far for the societal factors driving biodiversity change (driver indicators).

Table 1. The DPSIR-framework

Indicator type	Symbol	Examples concerning Farmland habitats
Driver	D	Structural change in agriculture, Common Agricultural Policy (CAP), international food markets, consumer preferences etc.
Pressure	P	Numbers of farms and livestock, amount of grazing, use of pesticides and fertilizers etc.
State	S	Status of common farmland birds and butterflies, abundance and structures of weed communities etc.
Impact	I	Numbers of red-listed farmland species and habitats, populations of Directive species and habitats
Response	R	Area under organic farming, management of traditional rural biotopes, agri-environmental support

This report has been organized according to the main habitat types present in Finland. Eight of the total of nine habitat types have been analysed in detail – rocky and esker habitats have been omitted from the report due to time constraints. The analysis begins with the largest habitat in area – forests – and ends with the second smallest – shores. This structure applies for both Chapter 1 on biodiversity status, trends and threats, as well as for Chapter 2 on the current status of biodiversity action plans and strategies.

1.2.2 Assessing the overall development of indicators – the arrow symbols

The overall development of each indicator has been illustrated by a symbol consisting of an arrow and a coloured background or frame. These symbols depict trends in the indicators on two levels. The background and frame colours relate to the historical impacts and trends in the indicators during the 20th century until 1990. The direction of the arrow indicates trends since 1990.

The interpretation of the symbol varies slightly depending on the type of indicator. In the case of pressure (P) and response (R) indicators, the background colour of the symbol relates to the historical impact of the human action in question (Table 2). In the case of state (S) and impact (I) indicators the coloured frame depicts historical trends in the specific component of biodiversity as defined in the indicator (Table 3). In all cases the arrows depict trends in the indicator since 1990. The selection of the type of arrow symbol is always based on a combination of quantitative criteria (time series analyses) and expert judgment.

Table 2: Key to arrow symbols used for pressure (P) and response (R) indicators.

Impact in the 20th century before 1990	Trend since 1990
Strong positive impact on biodiversity *Affecting >50% of the species and/or total area of the habitat*	Strong increasing trend *>1.5% annual increase or more than 35% increase over 20 years*
Moderate positive impact on biodiversity *Affecting 20–50% of the species and/or total area of the habitat*	Moderate increasing trend *>0.5–1.5% annual increase or 10–35% increase over 20 years*
Weak positive impact on biodiversity *Affecting <20% of the species and/or total area of the habitat*	Weak increasing trend *<0.5% annual increase or less than 10% increase over 20 years*
No clear impact on biodiversity, *or the phenomenon has been unknown or non-existent before 1990*	No discernible trend
Weak negative impact on biodiversity *Affecting <20% of the species and/or total area of the habitat*	Weak decreasing trend *<0.5% annual decrease or less than 10% decrease over 20 years*
Moderate negative impact on biodiversity *Affecting 20–50% of the species and/or total area of the habitat*	Moderate decreasing trend *>0.5–1.5% annual decrease or 10–35% decrease over 20 years*
Strong negative impact on biodiversity *Affecting >50% of the species and/or total area of the habitat*	Strong decreasing trend *>1.5% annual decrease or more than 35% decrease over 20 years*

Table 3: Key to arrow symbols used for state (S) and impact (I) indicators.

Trend in the 20th century before 1990	Trend since 1990
Strong increase *>100% increase in 90 years (>0.8% per year)*	Strong increasing trend *>1.5% annual increase or more than 35% increase over 20 years*
Moderate increase *20–100% increase in 90 years (0.8–0.2% per year)*	Moderate increasing trend *>0.5–1.5% annual increase or 10–35% increase over 20 years*
Weak increase *<20% increase in 90 years (<0.2% per year)*	Weak increasing trend *<0.5% annual increase or less than 10% increase over 20 years*
No change *or trend unknown*	No discernible trend
Weak decrease *<20% decrease in 90 years (<0.2% per year)*	Weak decreasing trend *<0.5% annual decrease or less than 10% decrease over 20 years*
Moderate decrease *20–50% decrease in 90 years (0.8–0.2% per year)*	Moderate decreasing trend *>0.–1.5% annual decrease or 10–35% decrease over 20 years*
Strong decrease *>50% decrease in 90 years (>0.8% per year)*	Strong decreasing trend *>1.5% annual decrease or more than 35% decrease over 20 years*

The arrow symbols have been developed based on the corresponding symbols used in the Millennium Ecosystem Assessment (2005). The approach of the Millennium Ecosystem Assessment has been extended and developed in terms of time spans, class definitions and trend criteria.

Monitoring data often limit the period for which the evaluation can be made. In many cases the data series do not cover the whole of the 20th century, but begin only in the 1950s or 1970s. In these cases, the symbols are based on a shorter time span. The choice of symbols is also made difficult by contrasting and fluctuating trends in time series.

All of the criteria listed above are meant as indicative and by no means definitive. They should give a rough idea of the volume of change that the symbols correspond to. Although nearly all indicators are based on quantitative monitoring and time series, expert judgment is still needed to combine data from incommensurate sources and decide what changes should be emphasised from the point of view of biodiversity. Interpretations of impact (I) indicators include the greatest amount of expert judgment.

Two examples are given here to further explain the selection of arrow symbols:

FO5 Forest roads (P)

Background: Finland's forest road network, which now totals 130,000 km, was largely built in the 1970s and 80s. The fragmenting effect of forest road network impacts the whole country. Most of these impacts are indirect, as the dense road network allows modern forestry practices to be applied even in remote places, but some are also direct, as forest roads increase the areas of edge habitats, for example. The background colour of the symbols is the darkest red because the building of forest roads has affected almost all of Finland’s extensive forests.

Arrow: The building of new forest roads peaked in 1993 but then decreased by 80% by 2007. The arrow points straight down because the pressure (new forest roads per year) has decreased steeply. If pressure were defined as the total length of the forest road network, then the arrow would point slightly upwards since some new roads are still being built and only a few kilometres have been actively restored to recreate original habitat conditions in protected areas.

UA3 Urban birds (S)

Frame: The comprehensive monitoring of Finland's common breeding birds in terrestrial habitats started in 1979. Between 1979 and 1989 the populations of the group of 14 species classified as urban birds increased on average by 15%. This corresponds to an increase of approximately 1.3% per year, which exceeds the limit set for strong increase (0.8% per year). However, the analysis is made less exact by the lack of earlier data.

Arrow: Between 1990 and 2008 urban birds increased by another 15%, which corresponds to a moderate increase as defined in the criteria.

Indicator-specific explanations for the selections of arrow symbols are also given in connection with each indicator at Biodiversity.fi.

The year 1990 has been chosen as the baseline for biodiversity conservation. The concept of biodiversity first became prominent in the international scientific and political arena in the late 1980s. The signing of the CBD in 1992 obliged contracting parties to revise their policies across all sectors of the society, in order to combat biodiversity loss. Finland ratified the CBD in 1994, and compiled its first NBSAP in 1997. It is therefore assumed that the effects of renewed biodiversity policies should gradually become detectable in pressures and responses starting from the second half of the 1990s, and later also in the state of biodiversity itself.

1.3 Characteristics of Finland's biodiversity

Finland’s total area including the Finnish territorial waters of the Baltic Sea is 420,000 square kilometres. Some 73% of this area consists of land areas, 8% of inland waters and 19% of marine waters (Figure 1). Approximately 44,000 species are known to occur regularly in Finland. At the moment, approximately 45% (19,962) of these species are known sufficiently well that experts have been able to assign a primary habitat for them.

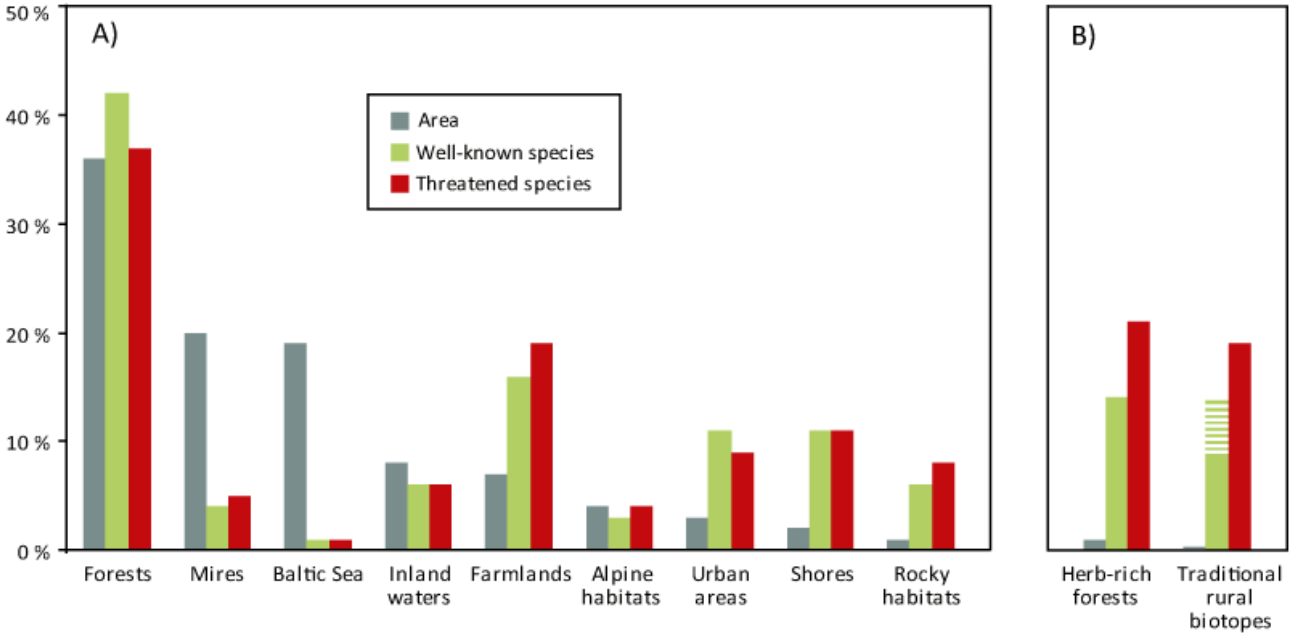


Figure 1. The proportional area of Finland's nine main habitat types used in this report and the proportion of well-known species and threatened species according to their primary habitats (A). The total land and water area of Finland is approximately 420,000 km^2 while the number of well-known species is 20,000 and that of threatened species 1,500. Herb-rich forests and traditional rural biotopes are shown separately as special second-level habitat types that are very restricted in area yet host a great number of well-known and threatened species (B). The exact number of species found in traditional rural biotopes remains unclear at present, but is likely to be in the excess of 10% of all well-known species.

Of Finland's nine primary habitat types the most extensive is forests. Forests on mineral soils cover 36% of the country (Figure 1). Mires comprise the next largest habitat type, covering 20% of the total area. However, the definitions of forests and mires vary widely depending on the context. In forest statistics compiled by the Finnish Forest Research Institute (Metla) and the FAO, for example, wooded peatlands are classified as forests. From an ecological point of view – which is also the point of view adopted in this report – it is often more purposeful to consider wooded peatlands as mires, due to their special characteristics arising from soil substrate and water balance. It must be remembered, though, that part of the forest indicators (indicators FO1–FO20) also include data for wooded mires due to the definitions used in forestry statistics and overlaps in species occurrences.

The figure for the overall proportion of farmland used here, obtained from the National Forest Inventory (NFI), is some 15–25% higher than the figure used in agricultural statistics. The NFI classifies some areas adjoining arable fields as farmlands, even where these areas are forested. These field margins and farmyards are often important habitats for farmland species. Areas classified as arctic fells are mainly open areas above the tree line, although most semi-open areas on their fringes (such as mountain birch forests) are also included. The estimate for the total area of shore habitats is the most unreliable figure, but can be considered to be roughly accurate. The total length of Finland's coastline is approximately 37,700 km (1:10 000; Laurila & Kalliola 2008) and inland water shorelines add up to 165,000 km (1:125 000; Kallio 2004).

Practically all vertebrate species have been assessed in Finnish red-list assessments. Other well-known groups of species include vascular plants, mosses, butterflies and beetles. The least well-known categories include algae and most other insect groups. Some 42% of the species assessed are forest species while the next greatest numbers of species can be found in farmlands (16%), shores (11%) and urban areas (11%). The shares of species associated with farmlands, rocky habitats, shores and urban areas are greater than the proportions of Finland's total area taken up by these environments. Fewer species are associated with marine and mire habitats, although the low number of marine species is largely due to the omission of plankton species from the evaluation.

In terms of threatened species, forests stand out again as the most important main habitat type. Some 37% of all threatened species are primarily forest species. One forest habitat type, herb-rich forests, hosts a particularly high number of red-listed species: more than half of all threatened forest species and 21% of all threatened species. Farmlands in general and traditional rural biotopes in particular are also hotspots for threatened species.

Due to delays in species' responses to ecosystem changes there may be a considerable amounts of unrealised extinction debt in the most heavily altered habitats in Finland. The last remnant populations of several species still survive today, although the critical threshold of their population size and/or the volume of the resources on which they depend may already have been passed. Contrastingly species' responses to increasing volumes of resources, such as the increasing amounts of dead wood in Southern Finland (FO6) may also be slower than expected, due to an inverse phenomena that could be described as recovery debt, in cases where it will take a long time for species to recover from low points in their populations even where conditions are favourable.

1.4 Forests

Forests are the most common and species-rich habitat type in Finland, and therefore central to the maintenance of biodiversity. Forests are the dominant element of landscapes in all parts of the country except for the very north where open alpine areas are most widespread.

Changes in forest biodiversity normally develop over long time spans. In commercially managed forests the rotation cycle from regeneration to final felling averages 60–120 years, depending on the forest type and geographical location. The period since the early 1990s during which purposeful biodiversity policies have been implemented in practical forest management has therefore been too short to demonstrate marked changes, for example, in stand structures, species compositions and the degree of fragmentation.

A paradigm change in forestry took place in the 1950s resulting in a more systematic even-aged management approach with intensified regeneration methods, soil preparation, thinning schemes etc. Before the 1950s forests were also widely utilised for wood production especially in Southern Finland. In the 19th and early 20th centuries poorly managed selective fellings resulted in the partial deterioration of forest resources. In Northern Finland forest management became more intensive and systematic only after World War II.

Table 4. Pressure (P) indicators for forest habitats (www.biodiversity.fi)

Indicator	DPSIR	Impact & trend	Explanation
F01 Wood removals: Total roundwood removals, log removals, use of wood chips for fuel, (as related information: annual increment of growing stock	P		Total roundwood removals increased by some 30% and log removals by 35% between 1990 and 2008. Increasing trends have been less clear in the 2000s than in the 1990s; the temporary record-high peak in 2007 was followed by a return to previous volumes in 2008. The harvesting of logging residues for bioenergy has increased rapidly during the 2000s, but is still fairly low. Earlier figures on roundwood consumption suggest that removals were quite stable between 1960 and 1990, but increased considerably before then. Wood removals exert a great pressure on forest biodiversity both in terms of their volume and the area affected. However, the total annual increment of the growing stock has long been greater than total removals. This surplus of wood could potentially benefit biodiversity.
F02 Fellings: Annual and cumulative regeneration felling area, (intermediate fellings)	P		The trend of the total area treated with regeneration fellings has been slightly increasing since 1970. The area of clear fellings has increased clearly (35%) while the area of seed shelter tree fellings has decreased (-25%). Since 1990 the increase of the clear felled area has been somewhat steeper than previously. Present clear felling practices were initiated in the 1950s. Individual clear felling areas were first very large on average, but have decreased substantially by the present decade. At present, retention trees are also left on the clear felling area (FO17). Since the 1950s modern regeneration felling practices have affected some 40–60% of commercially managed forests.
FO3 Soil preparation: Annual and cumulative soil preparation area, preparation methods	P		The treatment of clear-felled areas with scarring, ploughing and other soil preparation methods first started in the 1950s and became a standard practice in the 1960s. Altogether soil preparation has been applied to 4.8 million hectares of forest land, which represents 30% of all commercially managed forests on mineral soil. Since 1990 the annual area of soil preparation has fluctuated with no clear trend. However, the use of lighter methods has become more common.
FO4 Artificial regeneration: Annual artificial regeneration area, use of domestic seedlings by species	P		Since 1990 the annual area of artificially regenerated forest has remained almost stable. Seeding has increased slightly over planting from the 1990s to the 2000s and now accounts for 25% of all artificial regeneration. Artificial regeneration became a widespread method in the 1960s. Almost all plantings involve indigenous tree species. Since 1990 the planting of Scots pine and birches has decreased steeply, and Norway spruce plantings have increased almost correspondingly.
FO5 Forest roads: Length of new forest roads per year, total length of the forest road network	P		The building of new forest roads peaked in 1993 but has then decreased by 80% by 2007. The decrease is mainly due to the fact that the optimal economically determined density of forest roads has already been reached in most places. The largest part of Finland's forest road network, now totalling 130,000 km, was built in the 1970s and 80s. The fragmenting effect of forest roads impacts the whole country.

Over the past five to six decades relatively strong measures have been employed in order to increase timber production, which has remained by far the most economically profitable use of forest land. The total volumes of commercial and private-use forestry, measured by total roundwood removals, increased by approximately a third from 1990 to 2008 (FO1). Consequently, certain forest management practices create a threat to forest biodiversity in Finland.

Since the present methods were initiated in the 1950s nearly half of the total area of commercial forests has been subject to either clear cutting or seed tree and shelterwood fellings (FO2). During the same period the soils in three-quarters of this area have been subjected to soil preparation measures (FO3). Clear

fellings create open areas that increase forest fragmentation. Followed by soil preparation and artificial regeneration (FO4) they introduce structural features seldom found in natural forests.

The past 15 years have seen some shifts towards lighter soil preparation methods (FO4). Forest management recommendations and the PEFC forest certification system, which is widely used in Finland, require the leaving of some retention trees on felled areas (FO17). However, clear fellings followed by mechanic soil preparation and artificial regeneration by means of planting cultivated seedlings (FO5) remain by far the most common practice.

Despite the intensive measures applied in the majority of Finland's commercially managed forests, these forests cannot be compared with plantations in an international context. Nearly all of the seedlings used in artificial regeneration are of indigenous tree species, and although forestry operations limit heterogeneity, some natural species diversity always remains in commercially managed forests due to the higher natural regeneration potential of native deciduous tree species (FO9). This is aided by the relatively small average size of regeneration felling sites (approximately 1.5 ha). Furthermore, the average size of regeneration areas has decreased markedly since the 1970s.

Table 5. State (S) indicators for forest habitats (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
FO6 Dead wood: Volume of dead wood in forests on mineral soil	S		The volume of dead wood in Finnish forests declined dramatically during the 20th century, although no explicit monitoring data exists on historical trends. Dead wood was first measured in the ninth National Forest Inventory (NFI9) in 1996–2004. Between NFI9 and NFI10 (2004–2007) there was a slight increase in the volume of dead wood in Southern Finland.
FO7 Forest fragmentation	S		Indicator to be developed in 2010.
FO8 Forest age structure: The proportion of different age classes (with emphasis on old age classes)	S		In Southern Finland forests were dominated by young age classes (20–60 years) in the early 20th century as a result of widespread slash-and-burn cultivation. In Northern Finland forests were in a relatively natural state with the oldest age class (140+) being the most common. By the 21st century forests in the south have become older on average, yet stands belonging to old age classes (100+) have not increased since the 1980s. In Northern Finland the share of the oldest age class (140+) has fallen by nearly two-thirds from 45% to 17%. The decrease in the share of old age classes has slowed but continued since 1990.
FO9 Tree species composition: Forest area by dominant tree species, volume and share of deciduous trees (especially common aspen)	S		The preference for Scots pine over other species from the 1960s to the early 1990s in artificial regeneration and the draining of mires has increased the share of pine-dominated forests by more than 15% over the past 50 years. At the same time, the share of spruce-dominated forests has fallen by approximately 10%. These changes took place mainly between 1950 and 1990. Since 1990 trends have been mostly stable. The volume of common aspen has increased markedly in Southern Finland since 1990. This increase tracks the growth of the total volume of trees, so the share of common aspen in the total growing stock has increased only by 0.4%
FO10 Forest birds: Average population index of forest generalists and coniferous forest species	S		The monitoring period for generalist forest bird species and species associated with coniferous trees began in 1979. During this time, these groups have increased by 10% and 20%, respectively. There have been temporary declines in both groups, but on a longer time-scale trends have been increasing both before and after 1990.

FO11 Wildlife richness: Index reflecting the size and distribution of game animal populations by wildlife groups	S		The monitoring period for wildlife began in 1988, since when wildlife populations have remained stable on average. Large predators and ungulates have increased, whereas grouse species and mountain hares have declined.
FO12 Forest vegetation	**S**		Indicator to be developed in 2010.

The low volume of dead wood (FO6) is one of the main forest biodiversity issues in Finland at present. Altogether 4,000–5,000 species are dependent on dead wood habitats. These species account for approximately 10% all well-known species in Finland. During the past decade, in which dead wood has been explicitly measured in the National Forest Inventory, there has been a slight increase in the volume of dead wood, especially in the southern part of the country. This may reflect new recommendations and practices in commercial forestry (FO17).

The present typical volumes of dead wood of approximately 3 m^3/ha in Southern Finland and 7–8 m^3/ha in Northern Finland – remain far from the levels required by most endangered species (at least 20m^3/ha). In the natural forests of Southern Fennoscandia, typical volumes of dead wood range between 60 and 90 m^3/ha. Trees are particularly left in valuable habitats, along water courses (as buffer zones) and as retention trees in the regeneration areas. These trees gradually turn into dead wood over time.

Other major structural changes in forests include shifts in age structure (FO8) and tree species composition (FO9). Various management activities have affected these characteristics over the last few hundred years, and the resulting changes have had a considerable impact on forest biodiversity. Today only 5% of forests can be defined as natural or close to natural old-growth forests.

Since the 1920s forests have become older in Southern Finland and younger in Northern Finland. The age-class distribution of forests has thus become more even since the 1950s, in accordance with the goals of commercial forestry. According to the normal forest paradigm, which has been very influential in Finland, an even age-class distribution is desirable because it produces timber at a steady pace and optimises the economic revenue from logging. Since Scots pine was preferred in forest regeneration from the 1960s to early 1990s its dominance has increased over other species, especially over Norway spruce.

Common generalist forest birds and birds associated with coniferous forests (FO10) have fared relatively well despite the considerable changes in forests during the 30-year monitoring period. Some species have been able to adapt to the changes in forest structure, while others have even clearly benefited from them. Species included in these indicators thrive in young or middle-aged forests while none specifically require old-growth conditions. Curiously enough, even some of the species previously though to be old-growth specialists seem to have increased in recent decades. This underlines the adaptive capacity of birds as a species group.

There have been considerable changes in the structures of wildlife populations since late 1980s, but the overall trend for all wildlife species has been almost stable (FO11). In general, large predators have been recovering from a previous decline caused by excessive hunting pressure. Ungulates (moose and deer) generally benefit from fragmentation since they are able to find good feeding grounds in seedling stands and young forests, but other species including the wild forest reindeer are declining. Grouse species have largely declined, which is thought to be partly linked to the draining of mires (MI1) and changes in forest structure.

Table 6. Impact (I) indicators for forest habitats (www.biodiversity.fi)

Indicator	DPSIR	Trend	Explanation
FO13 Red-listed forest species: Number and share of red-listed forest species of all red-listed species.	I		In the latest red-list assessment published in 2000 forests were found to host more endangered species than any other major habitat type (37% of all red-listed species).
FO14 Directive forest species: Conservation status of Habitats Directive's species, population trends in Birds Directive species	I		The conservation status of two-thirds of the 32 forest species listed in the EU Habitats Directive have been evaluated as unfavourable-inadequate. The status of five species have been evaluated as favourable and two as unfavourable-bad.
FO15 Threatened forest habitat types: Share of threatened habitat types (methodology under development)	I		An assessment of Finland's threatened habitat types was published in 2008. According to the assessment, many Finnish forest habitats were evaluated as threatened. Forest habitat types are more threatened in Southern Finland than in the north. Criteria used in the assessment are based on the characteristics of natural forests. As a large majority of Finnish forests are semi-natural forests used for commercial production, the methodology and conclusions of this assessment need further development.
FO16 Directive forest habitats: Conservation status of Habitats Directive's habitat types	I		Six habitat types listed in the Habitats Directive have been defined in Finland as forests, although some mire, shore and alpine habitats may also be characterised by continuous tree cover. In the boreal region, the conservation status of all of these forest habitat types have been evaluated as unfavourable while the two habitat types occurring in the alpine zone were evaluated as favourably conserved.

The decline of dead wood and other features of natural forests is one of the main reasons for some 560 forest species having become endangered in Finland (FO13). Another historically important reason has been the clearance of herb-rich forests for agriculture in earlier centuries. Herb-rich forests remain a hotspot for forest biodiversity. They host almost one third of all well-known forest species, but account for only one percent of the total area of forests on mineral soils. The number of red-listed forest species has increased between 1990 and 2000 although comparisons are complicated by changes in red-list criteria and our increasing knowledge of species' ecology and population trends. The next national species red-list assessment survey is due to be published in late 2010.

The conservation status of nearly all forest vascular plant, moss and beetle species listed in the EU Habitats Directive were evaluated as unfavourable-inadequate in 2007 (FO14). Most of the beetle species depend on dead wood habitats, whereas the majority of the vascular plants and two mosses are associated with herb-rich, calcareous biotopes. The six Directive-listed mammal species have fared relatively better, and the conservation status of mountain hare and wild forest reindeer were assessed as favourable in the boreal zone, as was the status of the wolverine in the alpine zone.

An assessment of threatened habitat types in Finland was published in 2008 (FO15). The assessment indicates that many of forest habitat types are considered threatened.

The conservation status of the Directive-listed forest habitat types (FO16) reflect the results of the assessment of threatened habitat types in Finland. The status of coniferous forests on glaciofluvial eskers appears to be most worrying. The absence of forest fires has resulted in the closing of the canopy cover, which has changed the environmental conditions of esker communities requiring intense exposure to sunlight. The conservation status of forest habitat types occurring in the alpine region are considerably better than in the boreal region.

1.5 Mires

Finland is proportionately the most mire-rich country in the world. Although widespread and common, mires are relatively species-poor environments – only 4% of all well-known species are primarily mire species. However, many forest species are also found on wooded mires and species of several habitats use open mires as foraging or secondary breeding grounds. A considerable proportion of the species for which Finland has a special responsibility within the EU (18%) are mire species. The habitat diversity of mires is particularly high. Altogether there are some 80-100 different described mire types, and variations can be considerable even within a single mire complex.

Table 7. Pressure(P) indicators for mire habitats (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
MI1 Mire drainage: Area of drained mires, drainage status	P		More than five million hectares of mires were drained between 1950 and 1990 to increase tree growth. The annual drained area decreased throughout the 1990s until the practice virtually ended by 2001. Altogether 55% of the original mire area has been drained for forestry. According to National Forest Inventory, conditions in many drained areas have continued to shift towards drained peatland forests like conditions in the 2000s.
MI2 Ditch clearing: Annual ditch clearing, cumulative ditch clearing vs. cumulative first-time draining	P		Annual ditch clearing (second-time draining) operations remained at 20,000–30,000 ha/year for most of the 1960s to 1980s. Towards the end of 1980s this area increased sharply and since 1990 some 70,000–80,000 ha has been cleared annually. In total, 2.1 million hectares of peatlands, equalling almost 45% of the drained area, has been treated for the second time. Ditch clearing increases the impacts of draining.
MI3 Peat extraction: Area used annually for peat extraction, peat extraction area by region	P		Large-scale peat extraction for fuel started in the 1970s. By 1990 the annual mire area used for extraction was at 65,000 ha. This increased to 80,000 ha by the end of the 1990s and has since remained at this level. Altogether 110,000 ha has been used for peat extraction, corresponding to 1.2% of the total mire area.
MI4 Other uses of mires: Share of all mire uses, areas of mires that have been submerged under water reservoirs	P		Historically over 6% of the original mire area has been drained to create farmland. The building of roads and water reservoirs has claimed another 1–2%. Since 1990 no large-scale development projects have affected pristine mires, although considerable areas of mires are still being converted into fields, also including some pristine patches.

Altogether over 60% of Finland's original mire area has been drained for forestry, used for agriculture or peat extraction, been submerged under hydropower reservoirs, or developed with buildings and infrastructure, this has resulted in a complete or partial destruction of the original mire habitats. The disappearance of natural mires has been particularly pronounced in Southern Finland, where currently nearly 80% of the original mire area has been drained to increase the growth of trees. Before the intensive draining of mires for forestry, the conversion of mires into arable land especially affected the most nutrient-rich habitats such as rich fens, which today amount to less than 2% of the total mire area.

Over the past decade a major change has taken place in relation to the use of mires: the drainage of pristine mires largely ended in 2001 (MI1). In the absence of large-scale construction projects (e.g. hydropower reservoirs) the total area of undrained mires can be expected to remain almost stable for the first time in decades. In forestry, emphasis has shifted onto ditch clearing and supplementary ditching (MI2).

The impacts of peat extraction are concentrated within the supply zones around the largest peat-fired energy plants, and can be locally significant (MI3). Although peat extraction is supposed to be directed to already drained areas, as stated in the Government's national land use objectives and in the NBSAP (Action 7 in Table 30, see Chapter 2.2.2) many new peat production areas include areas that previously consisted of valuable, pristine mire habitat.

Table 8. State (S) indicators for mire habitats (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
MI5 Connectedness of pristine mires: Size class distribution of mire patches (pristine vs. drained) before and after large-scale draining for forestry	S		Since the large-scale draining of mires was initiated in the 1950s the size class distribution of pristine mire patches has shifted heavily towards the smaller size classes. Many mires that were previously large and uniform have been fragmented into several small drained and pristine patches. Since 1990 the further fragmentation of mires has probably been weak.
MI6 Dead wood on wooded mires: Average volume of dead wood	S		Dead wood volumes on wooded mires have increased by approximately 10% since the measurement of dead wood was included in the NFI in the mid-1990s. These volumes are, however, still very small, on average 3 m^3/ha No direct monitoring data exists on historical trends. Indirect evidence suggests that dead wood volumes were earlier many times higher, especially in spruce mires in the early 20th century.
MI7 Mire birds: Average population index of 12 mire species	S		The populations of mire birds have declined by almost 40% since suitable data series began to be compiled in the late 1970s. This decline has continued during the 2000s although there was at least a temporary upswing in 2007 and 2008.
MI8 Mire butterflies: Occurrence and abundance of 8 mire species	S		The National Butterfly Recording Scheme was started in 1991. Since then the distributions of Finnish mire butterflies appear to have shrunk, especially in Southern Finland where mire butterflies have only been reported in approximately half as many locations as in the early 1990s. More surprisingly, there seems to be a declining trend also in northern parts of the country, but this may be partially explained by changes in observation activity. Historical trends in mire butterfly populations remain unknown.
MI9 Mire vegetation	S		Indicator to be developed in 2010.

The four state indicators that have so far been developed all show a declining trend in mire biodiversity. The only slightly more positive signal is given by the recent trend in dead wood in wooded mires, which shows weak signs of recovery (MI6). Yet the volumes of dead wood (especially in spruce mires) have only recently been at their all-time lowest level, and remain very far from the volumes required by many dead wood specialist species, which are generally in the region of 20 m^3/ha or more.

An analysis of the size-class distribution of pristine mires before draining operations (early 1950s) and at present shows that the connectedness of pristine mires has decreased markedly (MI5). Due to fragmentation, the shapes of individual mires have changed from those defined by the complicated patterns following topography to sharp-edged drainage-delimited polygons. The original species-rich transition zones between mires and forests have been replaced with linear boundaries between drained and undrained mires. The isolation of the remaining undrained fragments has increased significantly. Present trends remain unknown, but judging from data on draining (MI1, MI2), peat extraction (MI3) and other uses of mires (MI4) fragmentation has been much slower than before, but has nevertheless continued since 1990.

The populations of mire birds (MI7) have been steeply declining, and the distributions of mire butterflies (MI8) have contracted over the duration of comprehensive monitoring schemes. Most mire birds are long-distance migrants, so the decline might be partly explained by changes in their wintering grounds. But an analysis of the combined data on species associated with open habitats yields almost equally steeply declining trends for both long-distance migrants and a group containing residents and short-distance migrants. Several mire birds are gradually disappearing from Southern Finland, where mires have been most extensively drained.

The occurrence of the eight mire specialist diurnal butterflies found in Finland follows a declining trend especially in the southern third of the country. Although there are differences in the habitat preferences of these species, many are quite sensitive to the draining of mires.

Table 9. Impact (I) indicators for mire habitats (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
MI10 Red-listed mire species: Number and share of red-listed mire species of all red-listed species, expected development by 2010	I		Altogether 67 mire species were evaluated as endangered in the latest red-list assessment for the year 2000. This corresponds to 4.5% of all red-listed species, equal to the share of mire species of all well-known species in Finland. The percentage of red-listed species among all mire species is expected to rise slightly by 2010 from approximately 9% to 10% (Auvinen et al. 2007).
MI11 Directive mire species: Conservation status of Habitats Directive-listed species, population trends in Birds Directive species	I		The conservation status of two-thirds of the 11 mire species listed in the Habitats Directive have been evaluated as unfavourable in the boreal region. The status of the two well-known mire species occurring in the alpine region are favourable. The historical population trends of the seven Birds Directive's mire species are somewhat unclear due to strong fluctuations and scanty monitoring data. Since 1990 the populations of two species have increased, while those of two other species have decreased markedly.
MI12 Red-listed mire habitats: Number of red-listed habitat types, share of red-listed types within habitat type groups	I		A little more than a half of the 54 mire habitat types included in the evaluation were evaluated as threatened in Finland. The greatest percentages of red-listed habitat types were found in the groups of spruce mires, rich fens and spruce-birch fens.
MI13 Directive mire habitats: Conservation status of Habitats Directive-listed habitat types	I		The conservation status of all mire habitat types listed in the Habitats Directive are unfavourable in the boreal region. The situation is much better in the alpine region where only the conservation status of palsa mires was evaluated as unfavourable-inadequate mainly because of adverse future prospects due to climate change. All other alpine mire habitats were evaluated as favourably conserved.

The list of endangered mire species (MI10) is surprisingly short given the magnitude of changes in mire habitats. More than half of the red-listed mire species are characteristic of rich fens. These habitats were already restricted in area before wider human influence, and they have been particularly widely affected by drainage to create farmland due to their high production potential. Only just over 10 species of fens and pine mires have been red-listed, although most common bird and butterfly species associated with these are declining (MI7, MI8).

Most of the Habitats Directive's mire species are endangered in Finland. The conservation status of almost all of these species have been evaluated as unfavourable-inadequate or unfavourable-bad. The population trends in the seven Birds Directive-listed mire species have been somewhat better on average. Two of these species – common crane and peregrine falcon - have even increased markedly over the past two to three decades. Three species have remained mostly stable (although strong periodic fluctuations make assessment difficult), while two previously common species are decreasing quite steeply.

The share of threatened mire habitats of all mire habitats is high, nearly 60%. The situation is particularly alarming in Southern Finland where this figure rises up to 75%. Also many nutrient-poor mire types, for example fens, have become threatened in Southern Finland in addition to the nutrient-rich types, many of which are also threatened in the north. The conservation status of Directive-listed habitat types reflect the results of the assessment of threatened habitat types. The status of Directive-listed mire habitats are considerably better in the alpine region, where drainage and other uses of mires have been only marginal.

1.6 Baltic Sea

Finland's territorial waters and Exclusive Economic Zone (EEZ) cover nearly 20% (81,650 km^2) of the total surface area of the Baltic Sea. Although these waters do not constitute any rationally delineated unit in ecological terms, this is the administrative area where Finnish laws apply and which Finland has responsibility for. Fewer than 300 marine species (1.4% of all well-known marine species) have been observed in these waters, although this is a serious underestimation in several respects. As many as 5,000 species of poorly known microalgae not included in the above figure may also occur in these waters. Due to low salinity levels, many freshwater species also thrive in Finnish marine waters. The Baltic Sea is especially sensitive to pollution because of its shallowness (with an average depth of just 55 m), its young age (formed only after the last ice age around 10,000 years ago) and its brackish water.

Table 10. Pressure (P) indicators for the Baltic Sea (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
BS1 Phosphorus: Phosphorus loads from rivers, total phosphorus content in surface water	P		Since 1990 there has been a moderate declining trend in phosphorus inputs from rivers. Between 1990 and 2007 riverine phosphorus loads decreased by some 20% although rainfall-driven annual fluctuations complicate interpretation. Phosphorus loading has contributed substantially to the eutrophication of the Baltic Sea in the 20th century.
BS2 Nitrogen: Nitrogen loads from rivers, total nitrogen content in surface water	P		Nitrogen loading has increased by 5–10% since 1990 although strong annual fluctuations can make trends unclear. Nitrogen loading increased considerably between 1970 and 1990, and also before 1970 although no comprehensive monitoring data exists for this earlier period. Along with phosphorus, nitrogen is the main contributor to eutrophication.
BS3 Harmful substances: Concentrations of PCB and DDT in Baltic herring	P		The concentrations of PCB and DDT in the muscle tissue of Baltic Herrings decreased by 2007 to less than one-fifth of their level in the mid 1980s. Trends in the concentrations of other harmful substances such as dioxins and hormonally active substances are less clear and largely unknown.
BS4 Maritime transport: Visits to Finnish harbours, oil transportation on the Gulf of Finland	P		The total number of visits to Finnish harbours almost doubled between the mid 1980s and the early 2000s. Over the past three years the numbers of arriving ro-ro vessels have decreased slightly, which has caused the total number of visits to decline. Oil transportation on the Gulf of Finland has increased sevenfold since 1990.

The most serious threat facing the Baltic Sea is eutrophication. For Finnish coastal waters this is particularly true of the Gulf of Finland and the Archipelago Sea, where factors including increased water turbidity and lowered oxygen concentrations cause extensive changes in plant and animal communities. Eutrophication is slightly less acute in the Bothnian Sea and the Bothnian Bay, which are less affected by loading from communities and agriculture. Since 1990 there has been a moderate declining trend in the phosphorus riverine loads (BS1) and a weak increasing trend of the nitrogen riverine loads (BS2) entering all sea areas. Phosphorus is more easily removed by sewage treatment plants than nitrogen.

In recent years the significance of loading from agriculture has increased. In the different sea areas between 45% and 75% of the total anthropogenic nitrogen and phosphorus loads entering the Baltic Sea

from Finnish territory originate from agriculture. Recent trends include increased runoff during winters due to milder winters and the consequent shorter duration of snow cover. This increases the role of diffuse loading, mainly from arable fields. Some 25–30% of the total nitrogen load entering the Baltic Sea falls as atmospheric deposition from shipping.

The concentrations of organochlorine compounds such as DDT and PCB that caused ecosystem-scale changes in the 1960s to 1980s have decreased markedly over the past two decades (BS3). However, there are many other harmful substances in the Baltic Sea that are still not being monitored comprehensively. Hormonally active, toxic and bioaccumulating substances are released into waters from pulp industry and in communal sewage water. In Finland the first list of National Priority Substances in the context of the Water Framework Directive (WFD) and the Dangerous Substances Directive (DSD) have been identified in 2006
(Government Decree on Substances Dangerous and Harmful to the Aquatic Environment 1022/20006), but the assessment could be made only on part of the intentionally produced substances. We don't know much about chemicals leaching to watercourses from imported products and chemicals regulated by other that the chemicals and pesticide acts, such as cosmetics and pharmaceuticals.

Hormonally active substances are released into waters from the pulp industry and in municipal wastewater. The concentrations found in Finnish wastewaters have caused changes in the sex-ratios of fish populations in laboratory experiments, but no data is available on such impacts in the marine environment. The monitoring of dioxins has yielded contradictory results. In some organisms concentrations seem to increasing while in others they are evidently decreasing.

The volume of maritime transport has increased steeply over the last two decades (BS4). The volumes of oil transportation on the Gulf of Finland have grown particularly rapidly (threefold between 2001 and 2007), increasing the risk of oil spills in this area. Most of the transportations originate from Russian harbours. The volumes of oil transported to and from Finnish harbours have increased by 25% since 1990. In addition to the direct impacts in the form of disturbance and erosion caused by moving vessels, the building and maintenance of the infrastructure supporting maritime traffic also impacts underwater communities. As noted above, nitrogen oxides from shipping also have a strong eutrophicating impact.

Table 11. State (S) indicators for the Baltic Sea (www.biodiversity.fi)

Indicator	DPSIR	Trend	Explanation
BS5 Visibility depth: Average visibility depth in the Gulf of Finland, the Bothnian Sea and the Bothnian Bay	S		The visibility depth of water in the open sea has been monitored since the early 1900s although there is a gap in data between the 1940s and 70s. Over this whole period visibility depth has halved in the Gulf of Finland and more than halved in the Bothnian Bay. The decline has been slightly less steep in the Bothnian Sea. Decreasing trends have continued since 1990 with the exception of the Gulf of Finland where trends in visibility may have been stabilising in the 2000s.
BS6 Algae: Chlorophyll-*a* concentrations, algal bloom observations Note: although the background colour of the arrow symbol is green, the increasing trend in algae would be commonly interpreted as declining water quality and thus detrimental for biodiversity.	S		Chlorophyll-*a* concentrations in coastal waters have increased by more than 50% since 1990. Concentrations have increased in southern sea areas much more than in the Gulf of Bothnia in the north. During the early monitoring period (1976 to 1990) there was almost no change, yet water quality observations point towards at least moderate increases earlier in the 20th century. Algal bloom observations have increased slightly during the 2000s.
BS7 Oxygen and benthic invertebrates: Seabed oxygen levels and occurrences of benthic invertebrates in the Gulf of Finland	S		The short data time series on bottom oxygen concentrations in the Gulf of Finland shows an increasing trend in the occurrence of anoxic seabed conditions between 1999 and 2006, while the situation seems to have been improving over the last two years, at least temporarily. The occurrences of benthic fauna follow this trend quite closely.

BS8 Archipelago birds: Sizes of archipelago bird populations by species groups	S		The populations of Finnish archipelago birds have increased nearly tenfold since their systematic monitoring was started in the 1930s. Increases in the numbers of gulls, terns and auks have continued quite steadily until today. Trends for waders have been more level since the 1950s, and a peak in the numbers of sea ducks in the 1990s has been followed by a steep decline during the 2000s.
BS9 Marine fish stocks	S		Indicator to be added in June–July 2009
BS10 Seals: Numbers of grey seals and Baltic ringed seals	S		The populations of these two seal species have increased markedly since comprehensive monitoring was started in 2000 for grey seals and in 1985 for Baltic ringed seals. Finland's grey seal population has nearly doubled in eight years and the total Baltic Sea population has increased even more. Ringed seals have also increased in the Bothnian Bay, but at a slower pace. Southern sub-populations have most likely decreased. Both species declined steeply in 20th century before the present monitoring schemes were initiated.

The three state indicators relating to the physical and biological qualities of sea water (BS5-BS7) all show declining or worsening trends. The visibility depths of water in open sea areas have declined by more than 50% since 1900 in the three sea areas for which long time series are available. The decline corresponds quite well with eutrophication in the Gulf of Finland, but its causes are inadequately known in the northern sea areas. Particularly in the Bothnian Bay there has been much less nutrient loading from rivers and coastal areas. The decline in visibility depths in the Bothnian Bay is more likely to have been caused by an increase in concentrations of humic substances in sea water.

Oxygen depletion and the occurrence of anoxic bottoms can be regarded as extreme impacts of eutrophication. When all oxygen is consumed by the decomposition of organic matter that has fallen to the seabed, toxic hydrogen sulphide is released and the sea bottoms become virtually devoid of life. Anoxic conditions also enhance internal loading: chemically bound phosphorus is released from the sediments to the further increase eutrophication. Although some benthic amphipods tolerate quite low oxygen levels, oxygen depletion always leads to lower species diversity. Oxygen depletion and the disappearance of benthic communities have so far been most acute in the Gulf of Finland and the Archipelago Sea, although some parts of the Bothnian Sea have also been affected.

The indicator on algae shows increasing trends both historically and since 1990. Despite these increasing trends and the corresponding rising arrow symbol, this development has been mostly negative in terms of biodiversity. Increasing concentrations of chlorophyll-*a* and the more frequent algal bloom observations are mostly caused by eutrophication, and therefore reflect the deteriorating state of the sea. However, as with all eutrophication, many species also benefit from the increased primary production reflected in the concentrations of chlorophyll-*a*.

One group of species that has mostly benefited from increased primary production is seabirds (BS8). The populations of archipelago birds have multiplied since the 1930s. Part of this increase can be explained by lighter hunting pressure (ducks, geese and perhaps gulls), but the increased availability of food has also played a role especially in the case of species that feed on fish and plants. The decline of the most numerous of the archipelago bird species, the common eider, over the past two decades is probably due to the increased size of predator populations, as reflected in the overall trend of the indicator since 1990.

The two Baltic seal species have increased over the past two decades (BS10). However, their numbers are still recovering from a low-point in the 1970s and 80s caused by intensive hunting. The future of the grey seal appears somewhat brighter than that of the Baltic ringed seal, because its breeding success does not depend on ice cover, as is the case for the ringed seal. The southern ringed seal sub-populations living in the Gulf of Finland and the Archipelago Sea are particularly at risk.

Table 12. Impact (I) indicators for the Baltic Sea (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
BS11 Red-listed marine species: Number and share of red-listed marine species of all red-listed species, expected development by 2010	I		In spite of the large-scale ecosystem changes that have particularly affected southern sea areas, only a small proportion of marine species have been red-listed (3.6%). The numbers of red-listed marine species are expected to remain almost constant until 2010.
BS12 Directive marine species: Conservation status of Habitats Directive-listed species, population trends in Birds Directive-listed species	I		The conservation status of one Habitats Directive-listed marine species has been evaluated as favourable while the status of the remaining four are unfavourable. The populations of two of the five Birds Directive-listed species declined prior to 1990. Subsequently two species have increased and one has declined. On the whole, trends in Directive-listed species were clearly negative before 1990, but subsequently approximately as many species have increased as declined.
BS13 Red-listed marine habitats: Number of red-listed habitat types, share of red-listed types within habitat type groups	I		More than half of marine underwater habitat types have been evaluated as threatened. Only the filamentous algal zone found in shallow water has been evaluated as of least concern in all coastal regions. The most threatened underwater habitat types are communities of red algae, bladder wrack, eelgrass and blue mussel. The strongholds of these communities are in the Archipelago Sea, where the situation is most alarming.
BS14 Directive marine habitats: Conservation status of Habitats Directive-listed habitat types	I		Although the areas and distributions of the six Baltic Sea habitat types listed in the Habitats Directive have been considered as remaining unaltered, their conservation status has been evaluated as unfavourable due to the structural and functional changes caused by eutrophication. These changes were considerable prior to 1990, and have continued thereafter slightly less acutely.

The small numbers of red-listed marine species in Finland may be partly accounted for by the poor level of knowledge concerning the biodiversity of the Baltic Sea. On the other hand, there are relatively few highly specialised species in the Baltic Sea, due to the sea's short evolutionary history and demanding brackish water conditions. The bird, fish, mollusc, macroalgae and vascular plant species that dominate the species composition of the Baltic Sea generally tolerate a relatively wide range of environmental circumstances, are therefore relatively resistant to ecosystem changes. It is their wide toleration range that enables these species to live in the Baltic's difficult brackish conditions in the first place. Many species occur at their physiological limits in the Baltic Sea.

Most of the Baltic Sea's five Habitats Directive-listed and six Birds Directive-listed species are classified as threatened. Accordingly, their recent trends, which have been stable overall, reflect those of other red-listed species. While trends in the number of red-listed species may not have been that alarming, the state of Baltic marine habitats gives reason for greater concern. More than half of all marine habitat types have been evaluated as threatened, and the conservation status of all Habitats Directive-listed habitat types as unfavourable. The structural and functional changes in these habitats have been considered to be so extensive that they give rise to negative evaluations even though their ranges and distributions have often remained more or less stable.

1. 7. Inland waters

The total surface area of inland waters in Finland is relatively large, approximately 3.4 million hectares. Fresh water bodies cover 8% of the total area of the country, which makes inland waters the fourth most extensive habitat type in Finland. Finland has almost 190,000 lakes and ponds of more than 0.1 hectares in size, and 600 rivers with a mean flow above 2 m^3/s. In addition to these lakes and rivers, Finland also has a great number of brooks, springs and ponds. Some 6% of all of the country's well-known species are found primarily in inland waters.

Table 13. Pressure (P) indicators for inland waters (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
IW1 Phosphorus: Phosphorus loading from point sources (time series), loading from all sources (distribution)	P		Phosphorus loads into inland waters from point sources have decreased considerably in recent decades. The volumes of loads from point sources started to decrease markedly in the 1970s and 80s when effective treatment facilities were installed in pulp factories, in particular, and as more wastewater was directed to sewage treatment plants. The prevention of loads from diffuse sources has not been as effective. The most important source of diffuse loading is agriculture, whose share of all anthropogenic phosphorus loads has risen to 60%.
IW2 Nitrogen: Phosphorus loading from point sources (time series), loading from all sources (distribution)	P		The decreases in nitrogen loads from all sources have been much less significant than for phosphorus. The effectiveness of nitrogen removal from wastewater has remained relatively low. Loads from industry have approximately halved since the mid 1980s, but loads from municipalities did not begin to decrease until the mid 1990s. By 2006 they had decreased by some 25%. The volumes of diffuse nitrogen loads have not decreased. Loads from agriculture into inland waters have probably even increased.
IW3 Harmful substances: Loads of heavy metals from industry, heavy metal concentrations in rivers	P		The loads of heavy metals from industrial sources entering inland waters decreased significantly between the early 1980s and 1990s, but have since remained mainly stable. The concentrations of lead in inland waters have decreased over the last decade while the concentrations of cadmium have increased since the beginning of the 21st century. Some heavy metals such as cadmium have a tendency to leach into rivers from acid sulphate soils.
IW4 Acidification: Alkalinity of small lakes, reported fish deaths related to discharges from acid sulphate soils	P		Finland's lakes started to receive considerable amounts of acid deposition in the 1950s when the burning of fossil fuels increased. International restrictions on emissions of sulphur and nitrogen oxides were set at the end of the 1970s and the lakes began to recover in the late 1980s. This positive development has continued since 1990. Acidity levels in watercourses occasionally increased to lethal levels during past decades, mainly in western Finland. The occurrence of acidic pulses originating from the oxidation of old soil substrates seems to have increased since the 1960s.
IW5 Regulated watercourses: Surface area of regulated watercourses, regulation intensity	P		Most of Finland's water level regulation schemes date from the 1950s to the 70s. Altogether 1.3 million hectares are presently regulated, which corresponds to 40% of the total surface area of inland waters. With the exception of two small regulation schemes that have been abandoned, there have been no changes in the areas affected by water level regulation since 1990. However, the magnitude and timing of regulation has been made less detrimental for biodiversity in several cases (see IW15).

The most important factors affecting inland waters are changes in water quality (IW1–IW4) as well as the artificial construction and regulation of water bodies (IW5). With decreasing loading from point sources, nutrient concentrations in many larger lakes and rivers have declined, whereas smaller rivers and lakes adjoining extensive areas of arable land are still undergoing eutrophication. Phosphorus has been effectively removed from wastewaters of industry and municipalities, but the removal of nitrogen has proved more difficult. Diffuse nitrogen loads from agriculture into inland waters are likely to have increased in spite of many efforts to combat such trends.

Airborne acidification, which formerly affected many clear-watered watershed lakes, is no longer considered a threat to biodiversity. However, another type of acidification has emerged as a serious, yet quite localised problem mainly in western coastal Finland. Acidic substrates dating from the Litorina phase (some 8500–4000 years ago) of the Baltic Sea have been exposed to oxygen due to the draining of land for forestry and agriculture. Long dry spells followed by heavy rainfall may release large quantities of highly acidic sulphur compounds into water courses. When such a pulse travels downstream through a river system, it can at worst kill nearly all of the fish and other animals in aquatic ecosystems.

Most Finnish rivers were cleared of rocks to facilitate the floating of timber in the late 19th and early 20th centuries, and most large rivers were dammed for hydropower between 1930 and 1980. Water level regulation affects more than one third of Finland's lakes by area, and a much larger proportion of the water volume, since most of the larger watercourses are regulated. One of the greatest changes regarding inland waters has been the clearing and straightening of small streams and brooks to improve forest drainage. Many springs have also been altered, mainly for water supply. In addition to the altering the courses of streams, forestry practices have also affected the biodiversity of small water bodies by changing the light conditions and microclimates of these habitats.

Table 14. State (S) indicators for inland waters (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
IW6 Amount of algae: Concentrations of chlorophyll-*a* in surface water Note: although the background colour of the arrow symbol is green the increasing trend in algae would commonly be interpreted as declining water quality and detrimental for biodiversity.	**S**		The concentrations of chlorophyll-*a* in lakes have decreased slightly during the past 25 years. In many larger lakes previously affected by point source loading from industrial and municipal wastewater, chlorophyll concentrations have clearly decreased. On the other hand, the chlorophyll concentrations in several small lakes affected by diffuse loading from agriculture and forestry have increased.
IW7 Organic matter: Concentration of humic substances in lakes and in rivers discharging into the Gulf of Bothnia	**S**		The average concentrations of organic matter evidently increased steeply during the early 20th century in certain rivers discharging into the Gulf of Bothnia for which early monitoring data is available. Sufficient data is not available between 1930 and 1970, but from the 1970s to the 1990s concentrations of organic matter decreased steadily in these rivers. Since 1990 there has again been a weak increasing trend. Average concentrations of organic matter in Finnish lakes do not show any clear long-term trends.
IW8 Inland water birds	**S**		Indicator to be developed by the end of 2009
IW9 Inland water fish stocks	**S**		Indicator to be developed in 2010.
IW10 State of streams	**S**		Indicator to be developed in 2010.

Although there have been great changes in the water quality of many lakes and rivers, average trends drawn from the network of monitored inland waters are surprisingly stable. This is mainly due to the relatively short data series and contrasting quality trends in lakes and rivers. From the 1960s to the 1970s even many large lakes were severely affected by loading from point sources. After the establishment of effective sewage treatment facilities in pulp factories and municipal sewage treatment plants the 1980s, the quality of these lakes improved. In contrast, water quality has not improved in inland waters affected by runoff from fields.

The monitoring of inland waters has long concentrated on water quality and other hydrological issues, and the biodiversity of freshwater systems has been much less extensively studied. Although some comprehensive monitoring schemes exist for waterfowl and certain fish stocks, no applicable indicators have yet been developed on this basis. Such indicators will be added to the Biodiversity.fi website in 2009 and 2010 as development works bears fruit.

Table 15. Impact (I) indicators for inland waters (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
IW11 Red-listed inland water species: Number and share of red-listed inland water species of all red-listed species, expected development by 2010	I		In 2000 threatened inland water species accounted for 5-6% of all of Finland's threatened species. As this figure is slightly smaller than the share of inland water species of all well-known species, it seems that the changes that have occurred in fresh water environments have not been quite as harmful as those in many terrestrial environments. It is probable, however, that the numbers of threatened species in freshwater environments will be greater in 2010 than in 2000.
IW12 Directive inland water species: Conservation status of Habitats Directive-listed species, population trends in Birds Directive-listed species	I		Compared with other habitats, the conservation status of Habitats Directive-listed inland water species are relatively good. In the boreal region the status of 68% of inland water species have been classed as favourable and 25% as unfavourable-inadequate. The status of all five species occurring in the alpine zone are favourable. The declines of most of species whose status is unfavourable took place before 1990, and their trends have since been stable. The populations of most of the Birds Directive-listed species have increased.
IW13 Red-listed inland water habitats: Number of red-listed habitat types, share of red-listed types within habitat type groups	I		Approximately 40% of inland water habitat types have been evaluated as threatened, and one third as near threatened. Streams are more threatened than lakes and ponds.
IW14 Directive-listed inland water habitats: Conservation status of Habitats Directive-listed habitat types in the alpine and boreal regions	I		Ten Finnish inland water habitat types are included in the EU Habitats Directive. Seven of these occur in both the boreal and alpine regions while three are naturally restricted to the boreal region. The conservation status of inland water habitat types in the alpine region are favourable. These water bodies are mainly in their natural state and the pressure from land use is low. In the boreal region, however, the status of all but one of the listed habitat types have been evaluated as unfavourable, and only alpine rivers found in the northernmost part of the boreal region are given a favourable status. The least favourable status has been assigned to small rivers and streams, springs and spring-fens, and naturally eutrophic lakes.

1.8 Farmlands

In Finland agriculture is largely concentrated in the south-western and western plains. Altogether farmlands cover 7% of the total area of the country, but in some areas farmlands may amount to more than a quarter of the total land area. Farmland habitats harbour 16% of all well-known species, making farmlands the second most species-rich habitat type in Finland. Traditional agricultural biotopes are especially important for many species, including almost 19% of all threatened species.

Table 16. Pressure (P) indicators for farmlands (www.biodiversity.fi)

Indicator	DPSIR	Impact & trend	Explanation
FA1 Active farms and arable area: Number of active farms and their average arable area	P		The ongoing decline in the number of farms and the increase in average farm size started in the 1960s. This development accelerated during the 1990s (on average -3.5 % per year) and has continued unchanged throughout the 2000s. Despite the long-continued declining trend, the existence of farms and arable has had a positive impact on biodiversity throughout the 20th century.

FA2 Livestock and livestock farms: Number of cattle and sheep, number of cattle and sheep farms	P		The number of cattle started to decline in the 1970s. From 1990 to 2008 the number of cattle farms declined by 65% and the number of cattle by 30%. Declines in the numbers of sheep and horses took place earlier in the 20th century. Their numbers have remained almost stable for the past two decades. As with farms and arable fields (FA1), the overall impact of livestock farming on biodiversity has been positive throughout the 20th century.
FA3 Fertilizer use and nitrogen balance: Amount of nutrients sold in fertilizers per arable land, nitrogen balance of arable lands	P		The amounts of fertilizers used per arable area peaked in 1990, and have since decreased by more than 40%. The nitrogen balances of fields have been traced back to 1985. They decreased by more one third by 2006 and are now at a European average level (50 kg/ha).
FA4 Pesticide use: Pesticide risk index and volume of sales, volume of biological pesticide sales	P		The use of pesticides peaked in the 1970s and remained at a high level throughout the 1980s. Between 1990 and 1995 the amount of pesticides sold to farmers fell by half, but sales then increased again by 50% between 1995 and 2007. The risk indicator shows even a steeper increase since the 1990s mainly due to the increasing use of strong fungicides.
FA5 Field clearance and reforestation: Annual clearing and afforestation of arable land	P		Despite high turnovers in both field clearance and reforestation, the total area of fields has remained almost stable since 1990. The areas newly cleared and the areas reforested have both corresponded to 0.5–1% of the total field area annually.

As a consequence of increased production pressures in farming, small farms have largely disappeared over the past two to three decades. The remaining farms are larger than before, and are characterised by intensified land-use practices such as sub-surface drainage. The numbers of cattle farms and cattle have declined, although the numbers of cattle have not declined as steeply as the number of cattle farms. The intensification of farming practices and decreases in the number of cattle have resulted in the decline of many habitats important for biodiversity (e.g. field margins and grazed meadows).

Positive trends in terms of biodiversity include decreases in the use of fertilizers and pesticides since 1990. The former trend, together with the increasing uptake of nutrients due to rising crop yields, has resulted in a substantial decrease in the nitrogen balance of fields since 1990. However, due to the relatively high levels fertilizer use prior to 1990 and changes in the climate, with less snow cover and more runoff during winter, nutrients are still leaching from fields into waterbodies at levels causing further eutrophication. The amounts of pesticides sold and especially the risks associated with these substances have started to grow over the past 6 to 7 years.

Finnish agricultural landscapes are characterised by relatively high annual turnovers of fields that are either cleared or reforested (0.5–1% of the total field area for both clearances and reforestation). Despite this turnover, the total area of arable land has remained rather constant and should thus provide stable resources for farmland biodiversity.

Table 17. State (S) indicators for farmlands (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
FA6 Field margins and buffer strips: Proportion of field margins of total arable area (case studies), annual area subsurface draining	S		The areas of field margins declined steeply between 1950 and 1990 mainly as a result of sub-surface drainage. Although agri-environmental support requires margins and buffer strips, their area has not increased overall due to the continuing intensification of land use.
FA7 Area of traditional biotopes: Area of traditional rural biotopes found in a survey in 1992–1998 by habitat type	S		The total area of traditional agricultural biotopes declined drastically during the 20th century. In 1990 such biotopes covered less than 2% of their total area in 1900. Although no comprehensive data exists on trends since 1990, their total area has probably remained constant over this period.
FA8 Common farmland birds: Average population index of 11 farmland birds	S		The farmland bird indicator reflects the pan-European decline of farmland birds, triggered in the 1950s by the intensification of farming practices. This prolonged declining trend has continued since 1990 (below -20% between 1990 and 2006) although the steepest decline may now be levelling off.
FA9 Farmland butterflies: Relative abundance of 50 farmland butterflies by species groups	S		The short data series on farmland butterflies shows no clear trend between 1999 and 2007. Trends before 1999 are largely unknown, yet it is fairly safe to assume that especially many meadowland species declined between the 1950s and the 1990s.
FA10 Weeds in spring cereal fields: Abundance of weeds by cultivation method (organic vs. conventional)	S		The abundance of weeds in spring cereal fields fell by more than 75% between the 1960s and the 1980s. Between the 1980s and the late 1990s their abundance recovered to 50% of levels in the 1960s.

The areas of field margins and other non-cultivated open landscape elements are not being monitored comprehensively. However, information from case studies and sub-surface draining statistics etc. suggests that their areas are not increasing, despite measures to promote them. The intensification of land-use can be considered as the most important factor affecting farmland biodiversity. The steep decline in traditional agricultural biotopes has particularly had a strong negative impact on biodiversity. Today, only 40,000 hectares of traditional agricultural biotopes are thought to remain, only a tiny fraction of their extent in the beginning of the 20th century.

Common farmland birds declined steeply until the late 1990s, but in the 2000s their populations have remained relatively stable. Comprehensive monitoring data on farmland butterflies exists only from 1999 onwards. Although no clear general trends can yet be observed, more species have declined than increased over the monitoring period (18 vs. 8 species). On the basis of expert judgment, most species associated with meadows and other traditional agricultural biotopes can be assumed to have decreased during the 20th century.

The abundance and diversity of weeds on spring cereal fields has partly recovered from a steep decline between the 1960s and 80s. This development can be linked with a decrease in the use of pesticides from the 1970s until the mid 1990s. Organically grown fields hosted even a higher abundance of weeds in the 1990s than conventional fields in the 1960s.

Table 18. Impact (I) indicators for farmlands (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
FA11 Red-listed farmland species: Number and share of red-listed farmland species of all red-listed species, expected development by 2010	I		Farmland habitats host 19% of all red-listed species in Finland. The majority of red-listed farmland species lives in dry meadows, but many occur also in wooded and mesic meadows. Arable lands are a primary habitat only for two percent of all red-listed farmland species. The number of red-listed species has been projected to increase from 340 in year 2000 to 380 in 2010 in well-known species groups.
FA12 Farmland Directive species: Conservation status of Habitats Directive's species, population development of Birds Directive species	I		The conservation status of none of the four farmland Habitats Directive species was evaluated as favourable in the boreal region. The status of three species is unfavourable-inadequate and that of European Polecat (*Mustela putorius*) unknown. The conservation status of the northern subspecies of Woodland Ringlet (*Erebia medusa* ssp. *polaris*) occurring in the arctic region was also evaluated as unfavourable. Four out of the five Birds Directive species declined during the 20th century prior to 1990. Since 1990 two of these have continued to decline while one species is clearly recovering.
FA13 Red-listed farmland habitats: Number of red-listed habitat types, share of red-listed types within habitat type groups	I		Of all farmland habitats, the red-list assessment of Finland's habitat types published in 2008 covered only traditional rural biotopes. Traditional rural biotopes host the greatest percentage of threatened habitat types: 93% of these habitat types were evaluated as threatened. Approximately 70% of traditional rural biotopes have even been evaluated as critically endangered. All dry and moist meadows as well as wooded meadows and pastures belong to this class.
FA14 Directive farmland habitats: Conservation status of Habitats Directive-listed farmland habitat types	I		Nearly all of the farmland habitat listed in the Habitats Directive types are traditional rural biotopes. The only exception is hydrophilous tall herb communities, which also occur naturally on stream banks and fells in the alpine region. Conservation status of all traditional rural biotopes in unfavourable in the boreal region. Nearly all types are in addition in unfavourable-bad and deteriorating state.

In farmland habitats the status and trends of threatened species and habitats (FA11, FA13) as well as habitats listed in the Habitats Directive (FA14) are first and foremost dependent on the area and quality of traditional rural biotopes. These host the great majority threatened species. All threatened and Directive habitats can also be defined as traditional rural biotopes.

Cultivated fields, field margins, fallow land, farm yards etc. also host a great number of species, but only a few of them are threatened. Many species groups associated with these habitats are faring relatively well although comprehensive monitoring data is currently unavailable for other groups apart from birds (FA8), butterflies (FA9) and weeds (FA10).

Proportionate to their total area, traditional rural biotopes constitute the most important hotspot for threatened species in Finland. Threatened farmland species are mainly vascular plants and insects, but dry meadows also host a number of threatened gilled and Gasteromycetes mushrooms and wooded meadows some lichens that grow on trees. The number of red-listed farmland species has been projected to increase even further between 2000 and 2010, but the true development will only be known as the new red-list is completed in 2010.

According to the red-list assessment traditional rural biotopes, the current status and trends are particularly worrying: only three alluvial meadow habitats out of the total of 40 habitat types evaluated were found non-endangered (near-threatened or vulnerable). The loss of habitat area has been very steep

in the 20th century and, in many cases, the present management practices are partly insufficient or unsuitable.

In spite of the high total number of species and number of red-listed species only five species listed in the Habitats Directive and another five in Birds Directive can be classified as farmland species. The conservation status and trends of these species is mainly unfavourable or declining. Only one bird species, the Corn Crake, has been clearly increasing in population size since 1990.

1.9. Alpine habitats

Finland has approximately 1.5 million hectares of alpine habitats (4% of the total area of the country), of which half are open fell habitats and the other half semi-open mountain birch forests. Mountain birch forests have been included in this main habitat type as a speciality of the Fennoscandian landscape. They form a transition zone between true forests and fell habitats. Alpine habitats cover the very northernmost parts of Finland as well as the more southern separate fells rising above the tree line, which in Northern Finland lies at approximately 300 to 500 metres above sea level. In general, Finland's arctic fells are relatively low and gently sloping, and covered with nutrient-poor acid soils. The fells of the very north-western corner of the country are an exception, with a starker relief and calcareous soils. Alpine habitats harbour 3% of the country's well-known species.

Table 19. Pressure (P) indicators for alpine habitats (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
AL1 Reindeer herds: Number of reindeer in 12 northernmost herding cooperatives' area, reindeer density	P		The total size of reindeer herds in the 12 northernmost herding co-operatives decreased from the record high numbers at the turn of 1980s and 90s by approximately 10% by 1993. Reindeer numbers have remained more or less at this level since. Between late 1970s and 1990 the herds increased twofold. Reindeer browsing and trampling have a strong impact especially on the vegetation of open and semi-open areas. This phenomenon affects nearly all alpine areas, protected and unprotected.
AL2 Tourism in Lapland: Overnights in Lapland, visits to Lapland's national parks	P		Between 1995 and 2007 the numbers of registered overnights increased by approximately 20% in Finland's three northernmost municipalities, and by 40% in the whole of Finnish Lapland. Visits to the two northernmost national parks increased by more than 20% between 1998 and 2007, and the very short time series for the two other alpine national parks suggest even faster growth. The impacts of tourism depend on the type of tourism, and may vary from positive indirect impacts to strongly negative direct impacts on vegetation and certain animal species.
AL3 Off-road traffic: Number of snowmobiles registered in Lapland, number of ATVs sold annually, number of helicopter flights in Lapland	P		Off-road traffic has increased dramatically over the last twenty years. Since 1995 the number of snowmobiles has increased by more than 50% in the whole country and by 20% in Northern Lapland. Almost a quarter of Finland's 100,000 snowmobiles are registered in Lapland. No extensive records exist of the numbers of all-terrain-vehicles, which have become very popular over the past decade. Only ATVs used on public roads need to be registered. In 2007 there were more than 13,700 registered ATVs in Finland, with approximately 500 of them registered in Lapland. Sales of ATVs have increased steeply during the early 21st century, with some 8,600 vehicles sold in 2007 alone. The total number of ATVs sold over the past ten years amounts to more than 35,000.

Large areas of fell habitats remain undeveloped and in relatively pristine condition. Apart from the emerging effects of climate change, the only truly widespread human-induced change has been the vegetation changes caused by reindeer herding. Reindeer husbandry has been the principal means of livelihood of the indigenous Saami people for centuries. The impacts of grazing reindeer became much stronger only during the 1970s and 1980s, when reindeer herds more than doubled from their post-war levels. In Finland reindeer husbandry is not limited only to the Saami. Since 1990 the maximum numbers of

reindeer permitted have been reduced three times, in 1997, 1998 and 2000. Despite these measures, grazing pressure continues to cause changes in plant species composition, results in local erosion, and partly prevents the rejuvenation of mountain birch stands previously killed by outbreaks of autumnal moth (*Epirrita autumnata*). Additionally, competing land use practices are restricting the opportunities for reindeer husbandry.

Other pressures with potentially strong but mainly local impacts on alpine biodiversity include national and international tourism and off-road traffic, which are often linked. The impacts of tourism on alpine biodiversity are difficult to evaluate as a whole. The harmful impacts of tourism in alpine areas can include the trampling and resultant erosion of vegetation cover, the disturbance of certain sensitive animal species, and the building of infrastructure. Beneficial impacts are mainly indirect, as nature tourism creates a demand for more conservation efforts and increases environmental awareness.

The increasing volumes of tourism are closely linked with the increasing numbers of snowmobiles, all-terrain-vehicles (ATVs) and helicopter flights in alpine areas, although a large share of off-road traffic is also related to reindeer herding and other forms of natural resource use. In addition to the high number of snowmobiles registered in Lapland, the numbers of snowmobiles in use in Lapland multiply every winter during the peak tourist season. The rapidly growing volumes of ATV traffic may cause even a more serious threat to sensitive alpine plant communities than snowmobile traffic. These vehicles are mainly used during snow-free seasons, so they leave more lasting marks on the ground. Motorised traffic also poses a threat to more sensitive alpine species due to disturbance.

Table 20. State (S) indicators for alpine habitats (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
AL4 Lichen pastures: Reindeer Lichen biomass based quality index of 12 northernmost herding cooperatives' lichen pastures	S		The long-term monitoring of the state of lichen pastures belonging to the 12 northernmost reindeer herding co-cooperatives was initiated in 1995. The state of lichen pastures was quite weak already in the mid 1990s and has continued to deteriorate since. In the latest inventory, half of the co-operatives' lichen pastures were assigned to the lowest quality class of 'heavily depleted'. Although no comprehensive monitoring data exists, based on trends in reindeer numbers and older observations it is safe to say that the state of lichen pastures was considerably better in the early 20th century.
AL5 Alpine birds	S		Indicator to be developed in 2010.
AL6 Alpine butterflies	S		Indicator to be developed in 2010.
AL7 Extent of palsa mires	S		Indicator to be developed in 2010.

At present, the lichen pastures that form the main basis of reindeer's winter diets are heavily depleted. At best one third of the biomass of lichen remains, at worst only 3%. During the monitoring period 1995–2008 the average biomasses of reindeer lichens decreased in all of the 12 northernmost herding cooperatives' areas, with the exception of one cooperative were lichen pastures were already heavily depleted by the mid 1990s and have since remained stable. The state of lichen pastures is most vividly reflected in the ecological state of the two most lichen-rich mountain birch forest types and in wind-exposed mountain heaths. Evaluations indicate that reindeer grazing has significantly weakened the quality of these habitats (AL10).

Indicators for alpine birds, butterflies and palsa mires are all awaiting further development and the accumulation of more monitoring data. The limited data available so far for these three state indicators conveys potentially alarming messages. Populations of alpine birds particularly appear to be declining, as

are the extent and quality of palsa mires. As a result of a warming in the climate, palsa mires are now at risk of disappearing from Finland entirely. Palsa mires are important habitats especially for wading birds.

Table 21. Impact indicators for alpine habitats (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
AL8 Red-listed alpine species: Number and share of red-listed alpine species of all red-listed species, expected development by 2010	I		Alpine habitats are a primary habitat for 63 red-listed species, which corresponds to 4% of all red listed-species in Finland. The numbers of threatened alpine species did not change significantly between the assessments completed in 1990 and 2000, but numbers are expected increase slightly by 2010.
AL9 Directive-listed alpine species: Conservation status of Habitats Directive's species, population development of Birds Directive species	I		The conservation status of 65% of the Habitats Directive-listed alpine species have been evaluated as favourable. The status of three species are unfavourable and the future prospects of one of these (arctic fox) appear particularly worrisome. Two-thirds of the Birds Directive-listed alpine species declined in the 20th century prior to 1990, but since 1990 trends remain mostly unclear or stable.
AL10 Red-listed alpine habitats: Number of red-listed habitat types, share of red-listed types within habitat type groups	I		15% of all alpine habitat types were classified as threatened. These cover approximately 10% of the total area of alpine habitats. Snow beds are the most threatened habitat types. Their total extent has decreased and this trend is expected to continue due to global climate change.
AL11 Directive-listed alpine habitats: Conservation status of Habitats Directive-listed alpine habitat types	I		The conservation status of the five alpine habitat types that occur in both the alpine and boreal regions and the two that occur only in the alpine region are mostly favourable. However, the status of two types (treeless alpine heaths and Nordic mountain birch forests) have been evaluated as unfavourable-inadequate in both the alpine and boreal regions. These two habitat types together cover the majority of Finland's alpine zone.

Many red-listed alpine species are restricted only to a few locations. These sites are often located in very northwestern part of Finland, which belongs to the Scandinavian Mountain range, or in isolated ravines and gorges. Such species are therefore particularly sensitive to environmental changes even on a very local scale. However, some species with a larger range are also threatened, such as four out of the five red-listed alpine bird species.

The conservation status of most of the Habitats Directive-listed alpine species have been evaluated as favourable. These species, including two mammals, three butterflies, and four vascular plants are generally well protected within existing protected areas. While the distributions of the two mammals are large, the rest of the species are as localised as the red-listed alpine species, and mainly restricted to the fells in Finland's mountainous northwestern corner. The most threatened Habitats Directive-listed species, the arctic fox, is nearing extinction in Finland. Based on sightings, the country's arctic fox population has been estimated at just five individuals.

Approximately 85% of all alpine habitat types are not acutely threatened (classed as least concern or near-threatened). Threatened habitat types are mainly at risk due to the impacts of reindeer grazing, climate change and tourism. The seven threatened alpine habitats consist of five dry heath types (open or covered by mountain birch forests) and two snow-dominated habitats. The two alpine Habitats Directive-listed habitats whose conservation status has been classed as inadequate are also dry heaths affected by reindeer grazing. Since the late 1970s, large reindeer herds have had a strong eroding effect on alpine habitats (AL1, AL4).

1.10 Urban areas

Urban areas here include areas used for transport infrastructure, such as harbours and airports, and other radically altered areas such as mines and landfills, as well as residential, commercial and industrial areas. More than 80% of Finland's population live in larger urban settlements, so urban environments constitute the setting for most Finns' daily interactions with nature.

Compared to most other European countries Finland's population density is low (averaging 17 inhabitants per km^2) and Finnish cities and towns are mainly small and far apart. Even the largest cities appear relatively green, with undeveloped patches among the infrastructure, and fields and forests always present close to city centres. Urban areas cover 3% of the country's total area and harbour 11% of all well-known species. These urban areas are thus markedly species-rich environments, although many of the species occurring in urban areas are not native to Finland.

Table 22. Pressure (P) indicators for urban habitats (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
UA1 Population centres: Area of population centres and percentage of people living in them	P		The total extent of Finland's urban areas has increased by more than 60% since consistent data series began in the 1980s. This increasing trend has been almost linear, and is still continuing.
UA2 Land use in urban areas	P		Indicator to be developed by early 2010.

In a sense, two opposing kinds of biodiversity may be found in urban areas: biodiversity present due to human influences; and biodiversity that remains in spite of human influences. Urban areas represent an interesting case where new developments may at the same time reduce native biodiversity but at the same time possibly create new diverse habitats. Parks, gardens and ruderal environments in particular offer secondary habitats to many native specialist insect species. Finnish towns and cities often have more species than comparably sized areas in the adjoining countryside. This can be accredited to factors including the greater diversity of man-made habitats, and the high frequency of disturbances, which maintain early successional stages in urban environments. Man-made habitats are dependent upon a certain degree of interference, but become unsuitable with more intense development.

The two selected pressure indicators (one of which is still under development) aim to assess urban developments from the angles described above. The extent of urban developments and the populations of urban centres reflect the total pressures inflicted upon native biodiversity by urban sprawl. The spreading of urban areas has been particularly fast in Finland in recent decades, when compared with the other Nordic Countries, for examples. The proportion of the population living in urban centres has also increased, but this increasing trend is now starting to level off, since the percentage is already high.

The other dimension of urban sprawl of interest in the context of biodiversity conservation is land use within urban areas. Parks and other green areas within cities and residential areas dominated by older detached houses with gardens have been found to be particularly species-rich environments.

Table 23. State (S) indicators for urban habitats (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
UA3 Urban birds: Average population index of urban bird species	S		The populations of the 14 species included in the urban birds indicator have increased on average by almost 45% over the last three decades. Their populations have increased steadily during the whole period.

The monitoring of urban biodiversity is still not systematically organised in Finland. The only comprehensive time series concerns urban birds (UA3). Some other long-term monitoring data also exist, for example on the occurrence in Helsinki of vascular plant species characteristic of herb-rich forests and spruce mires (from 1900 to the present), but these are limited to specific locations and are therefore difficult to apply in a country-wide assessment.

The populations of urban birds have increased significantly. In addition to species breeding in buildings, urban birds include species that prefer parks and other green areas within the urban matrix, as well as the species that have benefited the most from feeding during the winter. Several new species seem to be adapting to urban environments, which can be considered as a positive development in terms of both the future prospects of these species, and the increasing diversity of urban environments.

Table 24. Impact (I) indicators for urban habitats (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
UA4 Red-listed urban species: Number and share of red-listed urban species of all red-listed species, expected development by 2010	I		A total of 130 red-listed species are found primarily in urban habitats. This corresponds to 9% of all red-listed species in the country, and 6% of all the well-known species of urban habitats. The share of red-listed urban species is expected to grow slightly by 2010.

Compared with other habitats, the proportion of red-listed species among all urban species is quite low. Areas used for transport infrastructure and ruderal habitats constitute a hotspot of endangered urban biodiversity. These have become important supplementary habitats for several species that have disappeared from their original biotopes.

1.11 Shores

As a transitional habitat type characterised by both aquatic and terrestrial elements, shores constitute a biodiversity hotspot with 11% of all well-known species and only approximately 2% of the total area of Finland. Despite their significance for biodiversity, knowledge regarding shore species and habitat types is weaker than in the case of most other main habitat types. It is even difficult to estimate the total area of coastal and inland water shore habitats on the basis of present information sources. Only a few habitat types such as coastal reed beds and sand dunes have been surveyed to some extent. The monitoring of shore species has also been limited. Some wading birds and plant species belonging to the *Primula sibirica* group are being monitored on the coasts of the Bothnian Bay, for example, but more comprehensive monitoring of shore birds and vegetation remains unsystematic.

Table 25. Pressure (P) indicators for shore habitats (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
SH1 Shoreline used for building: Number of holiday homes, proportion of shoreline affected by buildings	P		The number of holiday homes in Finland has increased by 90% since 1980 and by 30% since 1990. In the 2000s the number of new holiday homes built annually has decreased slightly, but the stock of holiday homes is still increasing by approximately 1% every year. By 2005 an average of 41% of Finland's coastline was taken up by building developments. The use of shorelines for building is most intense in the western and southern provinces of Central Ostrobothnia and Eastern Uusimaa (50%) and least intensive in the northern provinces of Northern Ostrobothnia and Lapland (30–35%).
SH2 Fellings of shore forests	P		Indicator to be developed in 2010.

Finnish shore habitats are most seriously threatened by the cessation of traditional farming practices on coastal meadows (FA7, FA13), eutrophication (BS1, BS2, IW1, IW2) and the construction of holiday homes and other developments. Traditional farming practices, which were still relatively widespread during the 1950s and 1960s, created and maintained open coastal meadows. These habitats have since become overgrown by reeds (especially the common reed, *Phragmites australis*) and willows. Shore habitats also appear to be particularly susceptible to the harmful effects of invasive species.

The building of holiday homes along shores is very popular in Finland. The great majority of the country's approximately 450,000 holiday homes are built next to water. The number of holiday homes is particularly high when compared with the total number of buildings inhabited permanently. An analysis in which buildings along the coastline were counted together with their respective buffer zones of 50–100 metres revealed that 41% of Finland's total length of coastline (37,700 km, Laurila & Kalliola 2008) can be considered to be 'built up' according to this definition.

The building of holiday homes is often harmful to shore species due to disturbance, the management of riparian forests and physical alterations to the shoreline such as the building of quays, jetties and moorings. However, the owners of holiday homes may also contribute to the management of coastal meadows and undertake other activities that benefit biodiversity.

Table 26. State (S) indicators for shore habitats (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
SH3 Shore vegetation	**S**		Indicator to be developed in 2010.
SH4 Shore birds	**S**		Indicator to be developed in 2010.

No state indicators have yet been developed for shore habitats. Based on the monitoring of individual species and faunistic data, there have been increases among bird species that are unaffected by or benefit from the increased growth and volume of vegetation on shore habitats. Species associated with reed beds have particularly increased markedly. On the other hand, species that require open short grassland or sandy habitats are becoming rarer.

Table 27. Impact (I) indicators for shore habitats (www.biodiversity.fi).

Indicator	DPSIR	Trend	Explanation
SH5 Red-listed shore species: Number and share of red-listed shore species of all red-listed species, expected development by 2010	**I**		More than 160 threatened species can be defined as primarily shore species. This equals 11% of all threatened species in the country. Two thirds of these species occur on coastal shores, of which sand beaches are the most important habitat type. Another important habitat type are coastal shore meadows, which host 22% of the threatened species. According to an expert judgement from 2005, more new threatened species (20) will be named from shore habitats than from any other main habitat type by 2010.
SH6 Directive shore species: Conservation status of Habitats Directive's species, population development of Birds Directive species	**I**		Twelve species of the Habitats Directive are primarily shore species. The conservation status of the one species found in the alpine region was evaluated as favourable while that of nearly all species (10/11) occurring the boreal region was evaluated as unfavourable. The three Birds Directives species showed mixed trends in the 20th century before 1990.

			Since 1990 the two waders, Dunlin (*Calidris alpina schinzii*) and Terek Sandpiper (*Xenus cinereus*), have declined while the previously very rare newcomer Montagu's Harrier (*Circus pygargus*) has increased slightly.
SH7 Red-listed shore habitats: Share of red-listed habitats of all shore habitats on the coast of the Baltic Sea and along inland waters	I		Approximately 40% of shore habitat types are threatened. Although exact shore areas cannot be estimated due to data deficiencies, the share of threatened shore area of total shore area is notably less than 40% since many threatened shore habitat types are small. Threatened shores habitats of the Baltic Sea include different types of coastal sand beaches and dunes, which are all evaluated as vulnerable or endangered, as well as seashore meadows which are either endangered, critically endangered or too poorly known to be evaluated. The most threatened shore habitat types along inland waters are meadows on shores and flooded forests.
SH8 Directive shore habitats: Conservation status of Habitats Directive's habitat types	I		Of the 17 Habitats Directive's shore habitats 13 are found solely on the coast of the Baltic Sea. Two of the remaining four occur along river courses whereas two succession types have locations also relatively far away from the shoreline. The conservation status of three rocky shore habitats was evaluated as favourable while that of all dune, meadow and forest types was evaluated as unfavourable,

Along with traditional rural biotopes and herb-rich forests several open shore habitat types are particularly rich in threatened species. Part of this may be due to the fact that some of these habitats are naturally restricted in area (especially sand beaches and dunes), yet some others have declined steeply both in area and quality of habitat (shore meadows).

Two thirds of the Habitats Directive's species are vascular plants. They are mainly found on short-grass meadows or in shallow water. The conservation status of these species is unfavourable mainly due to eutrophication and overgrowth, of which the latter is partly caused by the former but also by the ending of livestock grazing on shore meadows. Of the other Directive species, the trends of the Dunlin (*Calidris alpina schinzii*) and Violet Copper (*Lycaena helle*) reflect this development.

II – Current status of National Biodiversity Strategies and Action Plans

2.1. Finland's National Biodiversity Strategy and Action Plan – An overview

In December 2006 the Finnish Government made its Decision-in-principle on the National Strategy for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016. The decision contains long-term outlines for the conservation and sustainable use of biodiversity in Finland. The National Strategy is accompanied by an Action Plan, together they form the new National Biodiversity Strategy and Action Plan 2006–2016 (NBSAP 2006–2016). A cornerstone of the NBSAP is sectoral integration, which means that conservation and sustainable use of biodiversity is promoted as an integral part of planning and activities in all socio-economic sectors in accordance with Article 6 of the Convention on Biological Diversity. Extensive co-operation is ensured between the ministries and other organisations working for the conservation and sustainable use of biodiversity in Finland. This also means that the objectives and actions largely are carried out within each sector, involving ministries, government agencies, local communities, non-governmental organisations and the private sector. An implementation and monitoring body has been set up and is chaired by the Ministry of the Environment to supervise and monitor the implementation of the NBSAP 2006–2016.

According to the NBSAP 2006–2016 the strategic objectives and the key means for achieving the 2010 biodiversity target are the following:

Objective 1. Improving the conservation and management of biodiversity

Key means**:** The main goal of CBD's Programme of Work on Protected Areas is to build up a global network of terrestrial protected areas by 2010 and a global network of marine protected areas by 2012. To preserve the ecological structures and functions of existing and new protected areas, the surrounding commercially used areas, on which the protected areas depend, should be managed using natural methods by 2015. For detailed information, see Appendix IIIB.

After the implementation of existing and approved national conservation programmes and when Finland's Natura 2000 network is completed, many of Finland's extensive natural areas or threatened areas as defined in CBD's Programme of Work on Protected Areas will come under protection. Finland's network of protected areas is already representative in the northern and eastern parts of the country, but there is still a particular need to improve the protection of forest biodiversity in Southern Finland. Finland's network of protected areas will be extended on the basis of the results of research, including a nationwide survey of threatened habitats due to be completed in 2010.

The interconnectivity of protected areas and natural corridors between areas will be improved through the adoption of ecosystem-based management methods, habitat restoration schemes, land use planning at the regional and landscape level, and the sustainable use of natural resources. It has been shown that regional concentrations of various protective measures can be an effective way to safeguard biodiversity. The voluntary and market-based conservation means successfully used in the METSO Forest Biodiversity Programme for Southern Finland could also in future be adapted and applied to improve conservation networks of other kinds and in other regions (see Chapter 2.2.1 for details of the METSO programme).

Important policy tools with regard to the conservation and sustainable use of biodiversity include environmental impact assessments for development projects, land use planning for protected areas and wilderness areas, other forms of land use planning, and legislation. Special land use planning solutions adopted in the Saami homeland affect the ways in which other steering mechanisms can be applied across most of the arctic fell region of northern Lapland. In this context it is vital to ensure that obligations set out in the CBD concerning the rights of indigenous peoples in line with Article 8(j) are fulfiled in Finland. The monitoring of protected areas will be intensified to help anticipate the impacts of climate change, especially in Eastern and Northern Finland.

Objective 2. Intensifying sectoral responsibility

Key means: The principle of sectoral responsibility has been adopted in the conservation and sustainable use of biodiversity. Much progress towards such responsibility has already been made within Finland's national administration already during the implementation of the first NBSAP (1997–2005). The implementation of the second NBSAP in the public administration is largely a matter of continuing to promote the ongoing favourable trends towards greater sectoral responsibility. However, this sectoral responsibility is still a challenge in Finland's biodiversity policy, as noted in the national evaluation of the first NBSAP.

Intensifying sectoral responsibility involves the incorporation of the objectives of the NBSAP into strategic sectoral planning. Many municipalities have already set good examples by incorporating the conservation and sustainable use of biodiversity into their own development processes.

The ecosystem approach stresses the importance of preserving in various ways the natural ecological structures and functions of habitats so as to safeguard beneficial natural values and processes that are the basis for ecosystem services. Several features from the ecosystem approach are being implemented in Finland by some sectors (in single-sector-based management). Methods and tools derived from the ecosystem approach are applied, for instance, in the planning and use of water resources, in regional planning of forestry, and in the management of all state-owned forests. However, there is still a need to integrate the principles of the ecosystem approach into a comprehensive and holistic management framework between different sectors (agriculture, fisheries, forestry, water resources, transport, and regional planning related to the conservation and sustainable use of natural resources). In the first stage, we need to strengthen implementation of the ecosystem approach and increase resources needed for implementing pilot projects.

Objective 3. Building up an improved knowledge base

Key means**:** Increasing amounts of research data have recently become available on the current state of and trends in biodiversity in Finland, and on the effectiveness of possible means to help maintain biodiversity. Major completed or ongoing research and development can be found on the web pages of the Finnish Clearing House Mechanism of the CBD (www.environment.fi/lumonet/) (NBSAP 2006–2016) and on the biodiversity indicator website (www.biodiversity.fi).

However, the dissemination of research results to decision-makers needs to be intensified by improving dialogues between researchers and data-users. More multidisciplinary and social science research should be conducted on issues related to biodiversity. More research should also be specifically designed to support decision-making and practical activities. Opportunities for the funding of a new joint multidisciplinary research programme should be assessed. The links between biodiversity and climate change are an important new research field. The impacts of climate change on biodiversity should be assessed so that scientists can anticipate as soon as possible the types of measures that will be needed to reduce or adapt to these impacts. This is a global challenge, and Finland has played a leading role in this regard in improving collaboration between countries in the boreal and arctic regions. (For more information see also Chapter 2.5.1, Chapter 2.5.2 on research and Chapter 2.5.8 on education and public awareness.)

Objective 4. Strengthening co-operation

Key means: Extensive co-operation will be ensured between the ministries and other organisations working for the conservation and sustainable use of biodiversity. It is vital that the continuity of the implementation of the NBSAP can be guaranteed and that the necessary revisions can be carried out whenever new governments are formed. This means that the NBSAP will have to be implemented under at least four different governments between the years 2006–2016. Linkages between the planning of State activities and budgets, the monitoring of the impacts of the plan, and improved productivity must also be considered.

The wide-ranging and challenging nature of these tasks necessitates the application of best administrative practices and management methods suited to cross-sectoral co-operation. In this context it is important to build on experiences gained during the recent implementation of strategic developments from the 1990s onward in Finland. (See also Chapters 3.1 and 3.2.)

Objective 5. Improving Finland's international influence

Finland is a party to all major global and regional international agreements concerning the conservation and sustainable use of biodiversity. The expansion of the whole concept of the conservation and sustainable use of biodiversity means that the various Multilateral Environmental Agreements (MEA) should be better coordinated. This is reflected in current trends in international environmental and development policies, and in Finland's work on development co-operation and regional co-operation.

There has been much discussion about the opportunities for co-operation and synergies between different MEAs. Such agreements tend to share many common and mutually supportive features and objectives. For instance, the CBD also supports the UN Framework Convention on Climate Change and the UN Convention to Combat Desertification. Implementing the CBD can strengthen the parties' ability to adapt to climate change, and also reduce some of the impacts of climate change that could particularly threaten food production in arid and dry areas, and of impoverished groups in developing countries. Intensifying the co-operation and dialogues between the different fields covered by MEAs remains a major challenge. The objective of halting the ongoing loss of biodiversity should be more widely incorporated into multilateral agreements, which should also be made to support each other more effectively.

Finland as a party to the CBD implements the programmes of work in line with our NBSAP 2006–2016 and with decisions taken by the Conference of Parties. The CBD has approved seven thematic programmes of work on marine and coastal biodiversity, agricultural biodiversity, forest biodiversity, dry and sub-humid lands biodiversity, inland waters biodiversity, mountain biodiversity and island biodiversity. As regards the seven working programmes, Finland is actively reporting and taking part in the work both nationally and regionally. This means that of the seven thematic programmes of work, five of them are relevant to Finland due to our biogeographical position. The European Union is preparing common submissions for notifications in which Finland is actively taking part. The procedural process and the way the submissions are prepared will be prepared on a case-by-case basis depending on the notification.

2.2. Results achieved and challenges encountered

2.2.1 Forests

Forest biodiversity is mainly affected by the volume and common practices of commercial forestry, and also by the conservation and restoration efforts carried out by the state and, to some degree, forest companies and private forest owners. Private citizens own 60% of Finland's forests, the state owns 26%, forest companies own 6%, and other owners (e.g. municipalities, parishes), 9%. The main policy instrument directing the utilisation of forest resources is the National Forest Programme. It was last revised in 2008.

Table 28. Actions listed in the NBSAP for forests and game animals.

1) Decisions will be made on the basis of the results of the METSO Forest Biodiversity Programme for Southern Finland to define further measures to improve the conservation of forests in Southern Finland.
2) Forest owners will be encouraged to promote the preservation and purposeful enhancement of ecologically valuable habitats and natural structural features of forests. Advice will be provided to encourage the consideration of biodiversity in timber harvesting and forestry. In commercially managed State-owned forests, the preservation of biodiversity will be given particular emphasis. The ecological characteristics of exceptionally valuable habitats referred to in Section 10 of the Forest Act and identified through the METE surveys will be preserved. Funds will be duly allocated under the Act on the Financing of Sustainable Forestry to promote the conservation and management of forest biodiversity.
3) The biodiversity impacts of increases in the harvesting of energy wood and of the methods applied will be evaluated. On the basis of these evaluations, the related legislation, guidelines and advice will be adjusted as necessary.

+ Four actions on game animals and stocks: safeguarding their habitats, natural behaviour patterns and annual life cycles (22); drawing up and implementing management plans for species that are significant in terms of conservation or socio-economic reasons (23); intensifying game monitoring and limiting the release and impacts of non-native game species on native stocks (24); and preventing damage caused by game species in the contexts of forestry, farming and road safety (25).

The new METSO Forest Biodiversity Programme for Southern Finland for 2008–2016 was approved by the government in March 2008. It builds upon the experiences gathered from the first pilot phase in 2003–2007 and, as concerns privately owned forests, continues to rely on voluntary protection measures. Altogether 182 million euros have been allocated for its implementation. Most of these funds will be directed to conservation on private land, but funds will also be directed to acquisitions of areas by the state, research, habitat restoration, guidance and communications.

The results of the research projects related to the first METSO period were published in 2006. According to these, voluntary conservation has gained widespread acceptance among forest owners. The voluntary approach has also increased the collaboration between forestry and environmental organisations. The forest sites protected through METSO's voluntary measures generally have high ecological values. The METSO programme includes both fixed-term and permanent measures for conservation, but permanent measures predominate. The main challenge related to fixed-term voluntary protection lies in the contradiction between conservation aims and the relatively short duration of the contracts. According to the evaluation of the programme, short-term temporary agreements are more suitable for conserving sites that require active management and whose natural values may change over time, whereas long-term or permanent agreements can be applied where biodiversity values are permanent or only evolve slowly.

New recommendations for forest management practices have been drafted for both private and state owned forests. In state-owned lands natural resource planning and landscape ecological planning have been applied to the whole area. These have advanced the identification and safeguarding of many valuable biotopes and introduced new practices such as maintaining connectivity in commercial forests. New ambitious goals for the amount of dead wood in both commercial and protected state-owned forests have been set.

In lands owned by private citizens and forest companies the survey of key forests biotopes has increased environmental awareness and furthered the conservation of some small-scale habitats. Key biotopes found in the survey cover approximately 0.5% of all privately owned forestry land. According to the monitoring results, their main characteristics have been well preserved in regeneration fellings (FO17). On the other hand, key biotopes are scattered and small-sized and the challenge for conservation is to form representative ecological networks.

The Act on the Financing of Sustainable Forestry was revised in 2008 so as to take into consideration the METSO programme. The Act also allocates funds to biodiversity-oriented management in private forests. This sum was raised to 8 million euros in 2009.

A new research programme on bioenergy harvesting from forests was initiated in 2007 by the Finnish Forest Research Institute (Metla). It includes analyses of the impacts on biodiversity of increasing the recovery of logging residues.

Table 29. Response (R) indicators for forest habitats (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
FO17 Nature management in commercial forests: Volume of retention trees, preservation of forest key habitats	R		Identification and safeguarding of key biotopes has been required by the Forest Act since 1996. Between 1996 and 2006 the proportion of unchanged key biotopes in the logging of private forest increased from 50% to 95%. Retention trees have been systematically left in regeneration areas since the mid-1990s. The number of retention trees left in regeneration areas has increased during the past decade, yet their total volume has remained constant and is still ecologically fairly small. Trees are also left in key habitats and along watercourses as buffer zones.
FO18 Prescribed burning: Annual and cumulative area of prescribed burning, (as related information: annual area of forest fires)	R		Prescribed burning was a relatively widely used treatment method of regeneration areas until the early 1960s. At its peak, altogether 30 000 hectares of forests were burned annually after cutting and removing most of the trees. Since 1990 the annual area of prescribed burning has been small (1 000-2 000 ha) and has declined further.
FO19 Protected forests: Share of protected forests of all forests according to vegetation zones	R		At present, 8% of forests on mineral soil are strictly protected. Based on the data on area acquisition, among other things, the total area of protected forests is estimated to have increased by more than 20% between 1990 and 2008.
FO20 Restoration and management in protected forests: Annual restoration and nature management area	R		Restoration in protected areas first started in the late 1980s. The annual amount of restoration in areas remained very small until the turn of the millennium. The years 2004-2007 marked a peak in restoration efforts with more than 2000 hectares restored annually. In 2008 approximately 1200 hectares were restored. Altogether some 13,500 hectares have been restored since 1990. Nature management is used for small herb-rich sites and for wooded semi-natural grasslands. The number of areas has been increasing in the 2000s.

Renewed recommendations for forests management practices emphasize nature management in commercial forests and include measures such as safeguarding key biotopes and other biologically valuable biotopes and leaving retention trees in regeneration areas (FO17). There are two voluntary forest certification schemes in operation in Finland. Of these, the Finnish Forest Certification System (FFCS) was first introduced in 1997. Today the successor to this, which is based on the certification scheme of the international PEFC Council (Programme for the Endorsement of Forest Certification schemes), covers more than 95% of privately owned forests. Of the measures listed in the criteria, the leaving of retention trees has so far been the most important new biodiversity conservation measure in private forests. According to monitoring results, more trees are actually left in regeneration areas (10–11 per ha) than what is defined as the minimum requirement (5 per ha). Some 10,000 hectares of forests have also been certified according to another international certification system of the Forest Stewardship Council (FCS).

Forest fires are natural phenomenon in Finnish forests. Several species depend on the impact of fire and many more benefit from the structural changes that it creates. Natural forest fires have been almost absent from Finnish forest for the past decades due effective fire control measures . The environmental conditions of fire dependent species can be ameliorated by prescribed burning, which was a relatively popular

treatment method of regeneration areas in the 1950s and 1960s as well as mid 1980s (FO18). For the past years the application of prescribed burning has been quite rare.

The area of protected forests has increased especially in the north (FO19). The deficiencies in the network of protected forest in the southern part of the country have been acknowledged. Increasing the area of protected areas in Southern Finland is one of the central goals of the METSO programme (see above). During 1996–2008 the Government sought to finalize the implementation of the various nature conservation programmes that were initiated in the 1980s and 1990s. Especially area acquisitions related to the old-growth and herb-rich forests conservation programmes have increased the total area of these special habitat types under protection. According to the report on the conservation status of habitats and species, under the EU reporting requirement of the Habitats Directive, Article 17, western taiga and herb-rich forests are in unfavourable-inadequate conservation status (see Habitats Directive report 2001–2006; see also Chapter 2.5.3).

Restoration in protected areas may enhance the state of endangered species considerably (FO20). Forest restoration consists mainly of three measures: burning, creating small openings and creating dead wood. Annual restoration areas have been planned to remain at the present level of 1000–2000 hectares.

Most of Finland's game animals are primarily forest species, although they commonly utilise a wide range of other habitats as well. Three of the four actions of the NSBAP related to game animals aim at retaining the original range and viable populations of wildlife species (Actions 22–24, Table 4). Along with the renewed recommendations for management (see above), several measures within agriculture aim at strengthening the populations of game animals. One of the most important recent measures has been the establishment of multipurpose wetlands, which has been included in the special contracts of the agri-environmental scheme, and, more recently, further promoted by a new non-production related subsidy (see Chapter 2.2.5).

Species-specific management plans have been drafted between 2005 and 2008 for the Grey Wolf, Brown Bear, Eurasian Lynx, Ringed and Grey Seal, Forest Reindeer and Grey Partridge. Furthermore, plans are in preparation for the Wolverine, Moose and forest grouse species. Of these species, the populations of large carnivores and ungulates are generally increasing while the population trend in grouse species has been less favourable (FO12). The monitoring and population estimates of game species are being further developed. Hunting permits are granted based on these estimates.

Increasing funding has been allocated to the prevention of collisions between vehicles and ungulates and many new solutions have been put into practice (including game fences and overpasses). After a peak in the number of collisions at the turn of the millennium, accidents involving moose have declined almost by half by 2008. In addition to new safety measures, this has been achieved by more effective population management. However, the number of collisions with deer species has increased steeply. The game management act will come into force on 1 December 2009.

2.2.2 Mires

Treeless or sparsely wooded mires have been traditionally classified as waste land in Finland. This reflects the view that has long prevailed in relation to mires: they are considered lands that could only be useful if transformed into some other type of habitat (forest or farmland) or if the substrate is extracted for fuel (peat production). A comprehensive examination of the ecosystem services provided by mires is yet to be carried out and the full value of mires is yet to be taken into consideration in policies affecting mire habitats. So far the most important shift in mire-related policies is the halting of the large-scale drainage of pristine mires for forestry in the early 2000s. This decision was mainly based on the low economic utility of further drainage projects, but conservation aspects also played a role. The transformation of mire habitat is now of a much smaller volume and restricted mainly to peat production and the clearance of mires for agriculture.

Table 30. Actions listed in the NBSAP for mires.

4) The hydrological states of protected mires will be evaluated, and the necessary plans then drawn up and implemented so as to adequately safeguard their natural state. Habitat restoration work will be continued in protected mires, with due consideration given to the need to carry out such measures over sufficiently wide areas. Sites for restoration will be delimited with due regard to their ecological coherence. At the same time, monitoring sites must be set up to assess the long-term impacts of restoration on loads in watercourses downstream and on greenhouse gas emissions.
5) Forest planning, voluntary conservation measures and the financing of sustainable forestry will be applied to help conserve mires and mire types whose preservation cannot be adequately guaranteed within the existing network of protected mires.
6) Drainage network maintenance schemes will be planned and implemented so as to ensure they do not further endanger biodiversity in the areas affected. Natural mires will no longer be drained for the purposes of farming or forestry.
7) Primarily only peatlands that have already been drained and peaty fields will be allocated, according to national land use objectives, for future peat extraction activities.

Preparations for the drafting of a national mire and peatland strategy were initiated in early 2009. This strategy has been planned to provide a shared vision of the future sustainable use and conservation of Finland's mires. The strategy has the potential to become an important policy document in terms of the conservation of mire biodiversity since there has not been a coherent and comprehensive guideline for the use of mires before. Among many other things, the strategy has been planned to include an evaluation of the status of protected mires (including an analysis of hydrology) and a preliminary assessment of the ecosystem services provided by mires.

Table 31. Response (R) indicators for mire habitats (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
MI14 Nature management of wooded mires	**R**		Indicator to be developed in 2010.
MI15 Re-use of peat extraction areas	**R**		Indicator to be developed in 2010.
MI16 Protected mires: Share of protected mires by vegetation zone	**R**		At present the proportion of protected mires of the total mire area varies from under 4% in the southern boreal zone to nearly 14% in northern Finland. No exact trends can be presented yet for the development of the protected mire area.
MI17 Mire restoration: Annual and cumulative mire restoration area	**R**		The first mire restoration projects were carried out in the 1980s, but only since 1994 has the annual restoration area been measured in hundreds of hectares. In the 2000s restored areas fluctuated between 500 hectares and 2000 hectares.

Approximately 12% of the present total area of 8.9 million hectares of mires has been included in protected areas or reserved for protection on state-owned land. This area is quite unevenly divided between different mire vegetation zones (i.e. mire type regions defined on the basis of geology and vegetation). The network of protected mires is relatively extensive and representative in the northern part of the country. In southern zones the proportion of protected mires drops down to less than five percent. Under-represented mire types in the network of protected mires are nutrient-rich mires (especially rich fens) and spruce mires in Southern Finland, successive mire series created by land uplift along the Bothnian Bay, small-scale mire and forest mosaics, and sloping fens.

Another deficiency in the network is that the entire mire basin has not been included within the boundaries of protected areas, and the parts outside the boundaries have consequently been altered by forestry

practices. Draining in the adjacent areas affects the water balance of protected mires. Often the flow of relatively nutrient-rich water from surrounding mineral soils is disrupted by ditches on the edges of the mire. Furthermore, the high degree of habitat fragmentation especially in the southern parts of the country poses a problem for mire conservation (MI5). Some of the deficiencies in mire conservation have been addressed in the METSO programme (see Chapter 2.2.1). Some naturally small mire types have been protected by private landowners under the Nature Conservation Act (black alder swamps) or the Forest Act (e.g. some rich spruce mire types and rich fens in southern Lapland).

By 2008 approximately 16,000 hectares of drained mires were restored in protected areas. This represents half of the estimated need for restoration within protected areas. The most common restoration measures include the blocking or filling in of the ditches and the removal of trees from originally open mires. The short-term effects of restoration have been encouraging. Rehydration of the restored sites has occurred and peat producing plant species have recovered. In commercial forests, without ditch drainage, the hydrological balance and mire vegetation would gradually be restored in some parts of the drained peatlands. Nevertheless, restoration can have negative impacts on the quality of the runoff water, but these are usually short term.

There is also a need for restoration measures in commercial forests. In these forests, without ditch drainage, the hydrological balance and mire vegetation would gradually be restored in some parts of the drained peatlands.

2.2.3 Baltic Sea

The main policy instrument directing the protection of the Baltic Sea is the international Baltic Sea Action Plan (BSAP), which was adopted by all the countries of the Baltic Sea catchment area except Denmark in late 2007. The BSAP is governed by the Helsinki Commission (HELCOM). Finland plays an active role in its implementation and development. The goal of the BSAP is to restore the good ecological status of the Baltic marine environment by 2021. The plan is based on a set of ecological objectives and it identifies both the specific actions needed to achieve the agreed targets as well as the relevant indicators to measure progress made in the conservation of the shared marine environment. Unfortunately, as the BSAP is not legally binding, the effectiveness of its implementation remains to be seen.

Table 32. Actions listed in the NBSAP for the Baltic Sea

26) The Helsinki Convention for the protection of the Baltic marine environment and the related recommendations and measures defined by the Helsinki Commission (HELCOM) will be duly implemented. **27)** Finland's Programme for the Protection of the Baltic Sea will be implemented, and nutrient inputs into the Baltic will also be reduced through international co-operation. **28)** Finland's coastal biodiversity will be assessed by completing the VELMU Inventory Programme for the Underwater Marine Environment by 2014. **29)** The need to expand the Natura 2000 network into Finland's exclusive economic zone will be assessed in accordance with decisions taken by the European Commission together with EU member states.

Table 33. Response (R) indicators for the Baltic Sea (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
BS15 Protected sea areas	**R**		Indicator to be developed by June 2009.
BS16 Water protection measures: Percentage of phosphorus and nitrogen removed at sewage treatment plants, total length of water pipes vs. sewers	**R**		Water protection measures concerning municipal and industrial sewage have been successful. For example, the percentage of phosphorus removed from household sewage at treatment plants increased from 26% in 1971 to 90% in 1990 and further to 95% in 2004. The corresponding figures for nitrogen were 22%, 31% and 49%.

Two of the four actions of the NBSAP that deal with the Baltic Sea directly concern the work of HELCOM and the Baltic Sea Action Plan (Table 4). Finland's own Programme for the Protection of the Baltic Sea (Action 27), which was approved by the government in 2002, has been largely supplanted by the BSAP in practice. During recent years knowledge regarding the state and development of the Baltic Sea has been greatly advanced. The Baltic Sea has also been proposed by the member states of HELCOM as a pilot area under the EU Marine Strategy Framework Directive, which Finland will begin to implement in 2009.

So far, however, Finland has not quite succeeded in reaching the most urgent goals of reducing the nutrient loading into the sea (BS1, BS2). Although the treatment of sewage waters from households and industry has improved substantially, the loading from agriculture has decreased only little. Many water protection measures have been included in the agri-environmental scheme (BS15), but until now, the effects of these have not been observed at the basin level. Some of the water protection measures in agriculture may also have been cancelled out by increased winter-time runoff due to a warming climate. Since 1991 Finland has actively supported the construction of wastewater collection and treatment facilities in Saint Petersburg, which has been identified as the largest single point-source polluter within the whole Baltic Sea region.

To fill in the largest gaps in knowledge regarding Finnish marine underwater biodiversity, a large-scale survey of the most important biotopes and of the distribution and range of different species and fish breeding grounds was initiated in 2004. The VELMU programme, which is to be completed by 2014, is now approximately at its mid-point. Large-scale mappings of underwater habitat types have already been completed in the Gulf of Finland, Archiplego Sea and Bothnian Bay. Fish breeding grounds have been surveyed in the Gulf of Finland and Archipelago Sea. Some of this work is also being done as part of an annual monitoring effort. Once completed the VELMU programme will advance the conservation of marine underwater biodiversity to a great extent.

Although no action of the NSBAP directly refers to maritime transport some important actions have been taken during the past years to mitigate and prevent the impact of increasing volumes of sea traffic. Particularly, risks related to oil transport on the Gulf of Finland have been assessed and new oil spill combating equipment has been acquired. In 2005 the Baltic Sea, with the exception of the Russian economic zone, was designated a Particularly Sea Sensitive Area by the International Maritime Organisation. This status requires additional protection measures such as increased control of ballast water.

Marine protected areas, which include above-surface marine and coastal habitats, have been recently substantially expanded. Seven seal reserves were established on state-owned land in 2001. These areas are mainly included in the Natura 2000 network; a review of expanding the network was done in 2008. Five sites have been proposed to be added to the Natura 2000 network and the proposals are going to be finalized in autumn 2009. These areas, totalling 30,000 hectares, consist of underwater habitats in both Finland's regional waters as well as in the outer parts of the Exclusive Economic Zone.

2.2.4 Inland waters

During the past few years the EU Water Framework Directive (WFD) has become the main policy instrument in terms of biodiversity management and conservation in inland waters. Related national legislation is currently being streamlined with the WFD. As such, the Finnish legislation concerning inland waters – including a general ban on the polluting of water and a stringent permit practice – has been quite effective in terms of water protection already since the 1970s.

Research related to Finnish inland waters has a long tradition of focusing on hydrology. Biodiversity has not been a priority issue so far. The WFD is likely to change this by emphasising biological communities as key elements of good ecological status. The monitoring of inland water communities is being developed to meet the requirements of the WFD.

The Act on Water Resources Management, which came into force at the end of 2004, defines five river basin areas in continental Finland, as well as the separate Åland Island area. Management plans concerning these were subjected to public comments between October 2008 and April 2009 in accordance with the WFD. Management plans for the Tornio and Teno river basins are being prepared together with Swedish and Norwegian authorities, respectively.

Table 34. Actions listed in the NBSAP for Inland waters.

10) Research into the ecological impacts of lake and watercourse restoration schemes will be intensified as part of Finland's implementation of the EU Water Framework Directive. **11)** Action will be taken to relieve the pressures on small water bodies. The need for restoration of small water bodies in Southern Finland will be assessed, and habitat restoration schemes will be implemented accordingly. **12)** Opportunities for river fish species to migrate and reproduce naturally will be improved through channel restoration work, the construction of ecological fishways and artificial breeding areas, and the removal of barriers to their movement. Fish stocks will also be managed so as to promote their natural reproduction. **13**) Measures to reduce the harmful impacts of artificial water level regulation and to improve such practices will continue in co-operation with permit holders, local authorities and other key actors. Monitoring of emission sources and water quality will be organized, and drainage basins will be restored according to the EU Water Framework Directive. **14**) Support will be provided to encourage a shift towards more environmentally beneficial aquaculture practices. More consideration will be given to the need to locate and scale fish-farming facilities in environmental terms, with surveys conducted to identify suitable areas for fish farming. **15)** Steps will be taken where necessary to reinforce declining stocks of valuable fish species through hatchery schemes and introduction of young fish. The preservation of threatened populations will also be safeguarded where necessary through introducing native populations through careful introduction of new stock. Introductions of fish from one river basin into another will be limited, and other such transfers of fish will be more effectively controlled. **16**) The Fish Health 2008 fish disease prevention strategy will be implemented.

The Finnish Game and Fisheries Research Institute, the Finnish Environment Institute, regional environment centres and the University of Oulu have conducted individual studies on the impacts of watercourse restoration on fish populations (Action 10). Some larger monitoring data sets have also been collected by Metsähallitus, Natural Heritage Services. These studies have mainly concentrated on small streams in Northern Ostrobothnia (north central Finland). There have also been plans concerning a country-wide survey of the success of river restoration.

Forests bordering on small water bodies have become one of the priority habitats in the METSO programme (Action 11). Local projects have been carried out especially in Northern Ostrobothnia and Kainuu to restore small forest streams. A guide on the restoration of streams in agricultural landscapes has been published and another one dealing with forest streams is being prepared.

The Operational Programme for the Finnish Fisheries Industry 2007–2013 enables the granting of investment subsidies towards the adoption of production methods that create less loading on fish farms (Action 14). At this early stage of the Action Plan period only a few projects have been subsidised, yet several greater investments are presently being considered. Subsidies may be granted towards the adoption of methods – such as recirculation systems and open sea farms – that clearly decrease the harmful impacts of fish farming. An evaluation has been carried out to select production methods which fulfil the requirements defined in European Fisheries Fund Regulation. A draft of Finland's National Aquaculture Programme 2015 has also been produced.

Especially during the past two decades steps have been taken both in agriculture and forestry to decrease the nutrient loads entering inland waters. These have included leaving buffer strips along waterways and better practices in the use of fertilizers. However, the area covered by wider buffer zones in agricultural areas has been small so far (FA6). The positive trend in terms of decreasing nutrient loading from point sources has continued (BS16).

Table 35. Response (R) indicators for inland waters (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
IW15 Regulation development: Coverage of regulation development projects, changes in winter drawdown	R		The first regulation development projects were carried out in the early 1990s. In 2004 ongoing or finalized projects covered more than 50% of the regulated surface area. The results of regulation development as measured by the decreasing winter drawdown have been notable in some lakes, while in others there has been virtually no change.
IW16 Protected inland waters	R		Indicator to be developed in 2010.
IW17 Restored inland waters	R		Indicator to be developed in 2010.

A considerable number of regulation development projects have been carried out since 1990 (Action 13, IW15). The results of these have generally been beneficial for biodiversity especially as the erosion caused by fluctuating water levels has decreased and spring floods have partially returned.

The network of protected inland water and shore areas has expanded as a result of Natura 2000 and is now considered representative in many respects. The situation concerning the conservation of small water bodies remains less satisfactory, albeit no comprehensive survey of their state has been conducted. Recently, there has been growing concern for these habitats within forestry and, for example, the survey of key biotopes has improved the situation to some degree.

There have been a multitude of projects for restoring built and eutrophicated rivers and lakes, although most of these have had some other primary goal besides safeguarding biodiversity. In the 2000s the first biodiversity-oriented restoration projects were carried out alongside many studies to this end. Less detrimental water-level regulation practices have also been developed and studied.

2.2.5 Farmlands

Since Finland joined the European Union in 1995, the Common Agricultural Policy (CAP) and the agri-environmental scheme (AES) have become the main policy instruments steering biodiversity conservation in farmland habitats. Four out of the five actions listed in the NBSAP concerning farmlands refer more or less directly to the AES. Therefore, the AES can also be considered the most important policy instrument of the NBSAP as regards farmland biodiversity (Table 28). The action concerning guidance, education and research is of a more general nature and does not therefore relate specifically to the AES. However, the parcel size is still small being only 2 hectares on an average.

Table 36. Actions listed in the NBSAP for farmlands.

17) Agricultural strategies, policies and practices that preserve and promote biodiversity will be further developed, through various means including the agri-environmental support scheme. **18)** Advice, training and research will be intensified so as to promote the management of biodiversity and the landscape in agriculture. **19)** The preservation of the habitats and routes used by farmland species will be safeguarded through agri-environmental measures. **20)** Designations of High Nature Value (HNV) farmland areas will be completed, and their future management guaranteed through their inclusion in the agri-environmental support scheme. **21)** The continued management of traditional agricultural biotopes and other ecologically valuable farmland areas will be safeguarded by 2010, with increased numbers of traditional agricultural biotopes actively managed. The management of traditional agricultural biotopes in protected areas will be intensified and expanded.

Most of the measures in the first Finnish AES (1995–1999) were clearly targeted towards water protection. In the second period of the AES (2000–2006) maintaining and increasing biodiversity on active farms was given more emphasis, but the main focus remained on water protection measures. This was also noted by the European Commission, which requested further improvements in the biodiversity measures in the Finnish AES. As a result, some adjustments have been made for the third period (2007–2013) such as the possibility to support the maintenance of traditional rural biotopes by NGOs outside of active farms. Although these measures will provide some novel ways of tackling important biodiversity issues, they are not likely to have a significant effect on the status of farmland biodiversity in Finland due their small scale. The main emphasis of the third AES period remains on water protection.

The AES constitutes one of the four policy axes of the Rural Development Programme for Mainland Finland 2007–2013. Although being clearly the main policy instrument in terms of biodiversity, nature values can also be promoted through the other axes that deal with the competitiveness of the agricultural and forestry sector, quality of life in rural areas and diversification of the rural economy as well as local rural development plans of local action groups. In these cases, biodiversity issues are tackled mainly through education and communication.

The impacts of the previous agri-environmental schemes have been studied in detail within the past decade. In general, the effects of the schemes have been in the desired direction, but have not been strong enough to offset the previous and partly still continuing decline in farmland biodiversity. For example, the establishment of uncultivated field margins – one of the key measures of the support scheme – resulted in approximately 9,000 to 17,500 hectares of field margins being left outside of cultivation. However, this amount was mainly added at once at the beginning of the first support period in 1995. Since then the loss of field margins as a result of the general intensification of land use on farms (subsurface drainage in particular) has probably exceeded the establishment of new areas as a result of the AES. The average field parcel size is still, however, rather small in Finland, approximately two hectares on average.

The impacts of the further intensification and specialisation of farming practices have mostly outweighed the actions taken to promote biodiversity. Also, the recent reform or 'Health Check' of CAP is likely to cause a considerable decline in the set-aside area in Finland, which in turn will have negative impacts on farmland biodiversity. Some adjustments have been made in early 2009 to the Rural Development Programme to compensate for these effects in the form of a new subsidy for special nature management fields. The most important of these is a new subsidy for nature management fields.

Table 37. Response (R) indicators for farmlands (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
FA15 Management of traditional biotopes: Area covered by management contracts for traditional rural biotopes within the AES, area of traditional rural biotopes managed on state-owned land	**R**		The active management of traditional biotopes started on a larger scale in the early 1990s. In earlier decades these habitats were still managed as a by-product of regular farming. In the 2000s slightly less than 25,000 hectares were managed under the agri-environmental support scheme and some 10,000 hectares otherwise (e.g. voluntarily).
FA16 Organic farming: Area under organic farming, share of organic farming by region	**R**		Organic farming increased steeply during the 1990s, but has stabilized at 7% of all arable land during the 2000s.
FA17 Agri-environmental support scheme: Share of mandatory additional measures, area covered by supplementary measures	**R**		The area covered by those supplementary measures of the agri-environmental support scheme that most clearly benefit biodiversity has remained at approximately 15,000 ha since 2001. The area of riparian zones has increased while that of multipurpose wetlands has decreased

The Finnish AES consists of measures on three levels. All participating farmers have to apply five mandatory basic measures. These address cultivation planning, fertilisation, plant protection and biodiversity management issues. On top of these, all farmers are obliged to implement at least one additional measure, the choice of which has increased from 6 to 13 between the second and third AES periods. The third level of measures of the AES are the special contracts that address more specialized environmental issues and require more concerted actions on behalf of the farmer.

Of all the measures included in the Finnish AES, the special contracts for the maintenance of traditional rural biotopes have been considered most effective in terms of their impact on biodiversity. In 2007 these voluntary special contracts covered 21,700 hectares on 2,300 farms. The quality of management of sites included in the AES was evaluated in 2004 in a case study covering one-tenth of the total area. As a main result, the enhancement of biodiversity was judged purposeful in as much as 95% of the contract area. Since 2007 financial support for the establishment of new traditional rural biotopes, as well as for multipurpose wetlands, has been available as a new non-production-related subsidy.

A considerable number of traditional rural biotopes are also managed by other actors outside of the agri-environmental scheme. Altogether, Metsähallitus (a State-owned enterprise), different NGOs and private individuals manage a few thousand hectares, increasing the area under management up to approximately 30,000 hectares. The total area under management has been slowly increasing until recent years, but it is still far from the suggested target level of 60,000 hectares by the year 2010.

In 2007 nearly 150,000 hectares of arable land were under organic farming. This represents approximately seven percent of the total arable area. Organic farming first started in the 1970s, but remained quite marginal until the 1990s. The percentage of organic farming increased rapidly during the 1990s and reached its peak in 2004. After that the percentage decreased, but now the area under organic farming is increasing slightly again. In a European context, the proportion of organic farming is nevertheless quite high, approximately 7% of the total field area.

The mandatory basic and additional measures – to which most of the funds of the AES are directed – are generally quite ineffective in terms of biodiversity. The establishment of field margins and buffer strips holds the greatest potential in terms of biodiversity. However, since field margins and buffer strips have been established mainly along ditches and water systems, which often are moist and nutrient rich sites because of water protection measures, their significance for biodiversity has been excellent so far. Another potentially effective measure in Finland is the large total area under winter vegetation cover (1.2 million ha). Winter cover has been shown to benefit some birds, soil fauna and invertebrates that over-winter on arable land.

The High Nature Value (HNV) farmland areas were defined nationally for the first time in 2009. This was carried out by ranking all individual Finnish farms according to several land use criteria reflecting their potential to maintain high farmland biodiversity. Altogether 7,700 farms making up 11% of all farmland were evaluated as HNV farms. It appears unlikely at the moment that these areas will be included as indicators in the AES, as drafted in Action 20 of the NSBAP (Table 28). The number and total area of HNV areas can nevertheless be used as an administrative indicator of the importance of maintaining farmland areas in the future.

2.2.6 Alpine habitats

Since the majority of Finland's alpine areas are protected in some way, the policies that affect alpine areas mainly deal with the use and management of protected areas. Another group of policies affecting alpine areas are those steering reindeer husbandry and defining the rights and the degree of self-governance of the indigenous Saami people. Policies aimed at combatting climate change are also highly relevant in terms of alpine biodiversity since the warming of the climate is expected to have a strong impact on the mountains of Fennoscandia where the northward movement of species and habitat types is limited by the sea.

Table 38. Actions listed in the NBSAP for alpine habitats

30) Land use practices, nature tourism and economic activities based on the use of biodiversity will be steered in the wilderness areas and protected areas of northernmost Finland so as to promote the preservation of biodiversity and the harmonization of various land use interests.
31) Reindeer husbandry and lichen pasture rotation practices will be further developed in co-operation with the reindeer husbandry districts to safeguard the carrying capacity of lichen pastures. Monitoring of the state of lichen pastures will continue, and pasture inventory methods will be improved.
32) Reindeer husbandry will be linked to economically viable farming so as to ensure the sustainable use of reindeer pastures by promoting structural developments in reindeer husbandry. In the Saami Homeland, steps will be taken to safeguard the traditional free-ranging grazing of rotation pastures, which forms the basis of the local Saami culture.

Table 39. Response (R) indicators for alpine habitats (www.biodiversity.fi)

Indicator	DPSIR	Impact & trend	Explanation
AL12 Integrity of wilderness areas	**R**		Indicator to be developed in 2010.
AL13 Management of wilderness areas: Coverage of management plans for wilderness areas	**R**		Between 1992 and 2008 comprehensive management plans have been in preparation for 9 out of the 12 wilderness areas situated in northern Lapland. Five of these have been completed and affirmed so far. These cover 50% of the total area of 1.3 million hectares of established wilderness areas.
AL14 Protected alpine habitats: Share of protected alpine areas	**R**		The network of conventional protected areas combined with the less strictly protected wilderness areas covers Finland's alpine areas extensively. Nearly 90% of all open and semi-open fell areas are covered by this network. The four major alpine national parks were established early on in the 1930s, 1950s and 1980s. All wilderness areas were established in 1991.

The area-specific management plans for protected and wilderness areas compiled by Metsähallitus have become the main policy tools for steering land use practices, nature tourism and economic activities in wilderness areas (Action 30, Table 4). Thus far management plans have been in preparation for all the largest areas (covering more than 90% of the total area) and the plans for five areas have been published and confirmed by the Ministry of the Environment (AL13).

The established wilderness areas have mostly retained their integrity, and local communities have been better integrated into the planning of their management. Within the areas, off-road traffic is mainly restricted to the official snowmobile routes. According to the memorandum of the Committee on Wilderness Areas, some forestry practices may be allowed in five of the areas, yet no commercial fellings have so far been executed. The delineation of some wilderness areas will be re-examined in conjunction with the overall analysis of the legislation concerning nature conservation.

Lichen grounds are monitored (AL4) and less disruptive reindeer husbandry practices have been studied by the Finnish Game and Fisheries Research Institute together with the University of Oulu (Table 4, Action 31). During 2004–2006 inventory methods have been further developed, taking into consideration better, for example, the rotation practices applied by herding cooperatives. An evaluation of the extent and spreading of infrastructure has been included in the monitoring programme and the role of forest structure as related to the abundance of epiphytic horsehair lichens (an important food source for reindeer) has been studied.

The structural development of reindeer husbandry has been steered by, for example, adopting a new animal-specific subsidy in 2008 (Table 4, Action 32). Subsidies are paid to families with more than 80 reindeer at the end of the season. Approximately 160,000 animals are thus included within the subsidy, which corresponds to nearly 80% of the total number of reindeer in Finland. According to the Finnish Saami Parliament, the research and monitoring concerning reindeer husbandry and lichen grounds has so far not taken into consideration the nomadic Saami husbandry practices in the fell region.

Conventional protected areas cover above 20% of all alpine areas. However, although less strictly protected, the 12 wilderness areas also protect alpine biodiversity quite extensively since almost no extractive forms of natural resource utilisation are allowed. The degree of protection is approximately 80% in Fell Lapland.

2.2.7 Urban areas

Some cities and even smaller municipalities may have rather well-informed policies in operation while many others do not. Comprehensive policies concerning urban biodiversity are still mainly missing or remain poorly developed. In the best cases, comprehensive surveys have been carried out locally of some aspects of biodiversity in urban areas and biodiversity information databases have been developed to support city planning (e.g. Helsinki, see below). However, country-wide biodiversity monitoring programmes, policies and planning practices remain a challenge for urban areas, including resource allocation.

In a programme of actions to safeguard biodiversity in Helsinki (known as the LUMO Programme), principles and key factors related to safeguarding biodiversity in the city will be defined, and an action plan will be drafted. The LUMO Programme was approved by the city's environmental committee in September 2008, but has not yet been agreed by the city council.

Table 40. Actions listed in the NBSAP for urban areas

36) A programme of research, publicity and planning related to the conservation of biodiversity of urban environments will be carried out during the period 2008–2010. The preservation of urban areas important for the conservation of biodiversity will be promoted. Planning principles and methods will be further developed for urban environments. New methods will be devised to monitor changes. **37)** The national urban parks network will be extended.

Table 41. Response (R) indicators for urban habitats (www.biodiversity.fi).

Indicator	DPSIR	Impact & trend	Explanation
UA5 National Urban Parks: Area covered by National Urban Parks	R		Four National Urban Parks have been established so far to preserve those parts of the urban fabric that have special recreational, historical and biodiversity values. The first National Urban Park was founded in 2001 and the latest in 2008. All present parks are situated in medium-sized cities in southern Finland and they cover a total area of nearly 9,000 hectares.
UA6 Protected areas in cities: Share of total area of the six largest cities within protected areas	R		The area of conventional protected areas has increased in the six largest cities since 1990.

The scarcity of research and lack of funding have prevented the launching of the urban environment research programme envisioned in Action 36 of the NSBAP (Table 40). Some research has contributed to the development of planning practices, but major research has been hampered because of lack of funding. New approaches have been developed, for example, in building, landscape planning and water channel construction. These have included better recognition of natural landscapes and creation of natural-like built elements. The purposeful management of special urban habitats such as ruderate sites, depots, arbour areas and so on remain largely unrealized.

National Urban Parks represent a new approach to conservation that has been enabled by the Land Use and Building Act, which came into force at the beginning of 2000. These parks are not conventional protected areas, but rather aim at safeguarding a continuum from natural habitats to heavily modified parks by setting limitations on city planning. Four National Urban Parks have been established so far, while the goal is to have about ten.

The area of protected areas in the largest cities has increased considerably on the whole although there are great differences between individual cities. During the trial phase of the METSO programme in 2002–2007 the nature values of forests owned by municipalities were investigated and measures for the further protection of these were proposed.

Although there have been positive changes in the two above-mentioned indicators, the continued urbanisation Finland leads to loss and fragmentation of habitats within existing urban areas and also outside urban centres through urban sprawl into the surrounding countryside. The effects of these changes on biodiversity are largely unknown but the few studies that have been made indicate that biodiversity losses are to be expected.

2.2.8 Shores

A national Coastal Zone Strategy was published in 2006 in accordance with the EU recommendation on integrated coastal zone management and use. This strategy outlines the long-term planning aims for the Finnish coastal zone taking into consideration the regional differences in natural conditions and in the uses of the coastline. No similar strategy exists for inland water shores. In addition to the Coastal Zone Strategy, the management of biodiversity of shore habitats is directed most importantly by policies within agriculture and forestry, as well as by land use planning.

Table 42. Actions listed in the NBSAP for wetlands. The Finnish NBSAP does not include any actions that would be directed explicitly at shores. However, most of the bird wetlands referred to in these actions are in fact shore habitats (e.g. reed beds and shore meadows).

8) Habitat restoration measures will be carried out at sites within the Bird Wetland Conservation Programme as prioritized, with steps taken to maintain the results achieved and monitor the impacts of the restoration measures. Former peat extraction sites will be made into wetlands, former wetlands will be restored, and new wetlands created.
9) Means to preserve bird wetlands will be agreed together with landowners, aiming to ensure that wetlands are preserved in as ecologically diverse a condition as possible, while also improving opportunities for the sustainable exploitation of waterfowl stocks.

Table 43. Response (R) indicators for shore habitats (www.biodiversity.fi)

Indicator	DPSIR	Impact & trend	Explanation
SH9 Buffer zones	**R**		Indicator to be developed in 2010.
SH10 Protected shores: Share of the coastline and lake shoreline within protected areas	**R**		The share of the coastline included within protected areas varies from approximately 15% in southeastern and southwestern Finland to above 35% in eastern Uusimaa region. On average 25% of the coastline is protected. The corresponding figure for lake shoreline is 16%. The share of protected lake shoreline increases from 8% in the southern coast to 80% in northern Lapland.
SH11 Management of waterfowl wetlands	**R**		Indicator to be developed in 2010.

A Shore Conservation Programme from 1992 and a Bird Wetland Conservation Programme from 1982 have guaranteed that the approximately 220,000 hectares of shore habitats and adjacent water areas included in the programmes have been retained more or less in a natural state. During the past decade new areas included in the Natura 2000 network have increased the representativeness of the network of protected shore areas substantially.

Some coastal meadows are now being managed as a result of the agri-environmental scheme. Several projects have also been carried out by the environmental administration, Metsähallitus and NGOs. These projects have aimed at restoring and managing important coastal bird areas. Some of these have received LIFE funding from the European Union.

Some new wetlands have been created and existing ones managed in agricultural areas enabled by the special contracts of the agri-environmental scheme (FA17). In 2008 these included a total of 200 hectares of wetland on 300 farms. A national strategy for game wetlands is under development and is to be finalized during 2009. Agricultural wetlands are normally small artificially created ponds, which could also be classified as inland water habitats. However, due to their small size and shallow water, they are covered mostly by reeds and other shore vegetation.

2.3 Conservation of biodiversity

2.3.1 Protected areas network in Finland

Finland's national network of protected areas is managed by the Natural Heritage Services (NHS) of Metsähallitus, a State-owned enterprise which administers State-owned forests and water areas. The nature conservation activities of the Natural Heritage Services are under the guidance of the Ministry of the Environment. Under the CBD Programme of Work on Protected Areas (PoWPA), the national conservation work is steered towards achieving the global 2010 goals and targets (see Appendix IIIB). Its implementation has become more efficient since the new national strategy and action plan for conservation and sustainable use of biodiversity was accepted for the period 2006–2016.

Some 12% of Finland's total surface area is now under protection, counting legally established protected areas. When other areas reserved for nature conservation programmes are also counted, including European Union Natura 2000 network sites, the total area under protection increases to 15%. Establishment of Natura 2000 protected areas complimented the existing network and notably increased the protection of still inadequately protected marine habitats and inland waters. The largest protected areas are in Northern Finland (see Fig. 1, Appendix IIIB).

International evaluations of NHS's performance have been important milestones in designing the protected area network and finding the appropriate direction for protected area management. Particularly, the management effectiveness evaluation of the protected area system (2004) and the subsequent State of the Parks Report (2007), both utilizing the framework of the IUCN World Commission on Protected Areas, provided excellent guidance for focusing the work, with high performance levels, on taking care of Finland's protected area system. The NHS and its strategically important partners such as research institutes, local and regional authorities, indigenous people and the private sector form an effective forum for collaboration on establishing a potentially strong protected area system to champion the global conservation challenges and goals.

However, the goals and targets set by the CBD PoWPA are extremely demanding, let alone the broader biodiversity conservation challenge. The value of protected areas in overall biodiversity conservation and the need for integrating protected areas into the broader landscape and seascape surroundings to improve connectivity and resilience against global changes have been recognized. To succeed in integration there is also a need to involve other sectors, natural resource sectors in particular, in protected area management. More knowledge is needed about the distribution of threatened habitats and habitat types under the Habitats Directive both within and outside protected areas. Finland's current status, future priorities and the need to improve performance are demonstrated in Annex IIIB in regard to CBD's Programme of Work on Protected Areas.

Finland has been working towards several of the objectives of **the Global Plant Conservation Strategy (GSPC)** in various administrative spheres (see GSPC report in Appendix IIIA). The national legislation gives tools to safeguard plant richness and vegetation. Central instruments in plant conservation are the Nature Conservation Act, the Forest Act, the Land Use and Building Act, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the EU's Common Agricultural Policy (CAP). The environmental administration has conducted assessments of the threatened status of plant species (see Chapter 2.3.2 Species, and Target 2 in Appendix IIIA), and has also widely promoted the conservation, management and monitoring of plant species and their habitats. Protected areas represent fairly well the plant richness and vegetation in Northern Finland. The Finnish Museum of Natural History maintains a national plant species register. The Ministry of Agriculture and Forestry actively promotes the preservation of forest biodiversity and valuable habitats such as traditional agricultural biotopes. Almost all commercial forests are certified. The revised criteria for ecologically sustainable forestry are directed towards preserving typical forest habitats and their characteristics, as well as safeguarding the conditions required by species inhabiting forests.

The conservation, management and monitoring of plants and fungi and their habitats have also been widely promoted at regional and local level, but there are no overall plans at national level, however. During

2004–2005 the Finnish Environment Institute and Metsähallitus together prepared a preliminary proposal for a set of national plant conservation objectives based on the international strategies mentioned above. These objectives are mainly included in the NBSAP for the period 2006–2016.

However, there is still a need to promote protection of certain plant and fungi species and vegetation types restricted mainly to old-growth or herb-rich forests of Southern Finland. This need was partly met through the METSO programme in 2003–2007 and will be addressed in the new programme in 2008–2016. Other challenges for plant conservation in the future are conservation and management of plants and fungi and their habitats in other environments, implementation of the National Alien Species Strategy that is under preparation and will be published in 2010, and research on genetic diversity of plants. An additional challenge is to provide check lists of all species on the Internet and information about current sites of threatened species in a database for the purposes of land use planning. A special national monitoring group is needed to enhance and evaluate implementation of the targets of the GSPC.

2.3.2 Species

Finland is one of the world's leading countries in the evaluation of species' conservation status. Of the approximately 43,000 species of flora, fauna and fungi found in Finland, about 19,000 species were assessed for the third "red list" assessment which was conducted in 2000 (Rassi et al. 2001). Sufficient data were available to define the status of some 15,000 of these species. Even though species in Finland are fairly well known there will be a considerable rise in the number of species that can be evaluated in the fourth red list assessment, which will be published in 2010. The number of red-listed species is estimated to increase by some 150 species (11%) by 2010. The increase will most likely be due to better knowledge of poorly known species groups, especially insects and fungi. In well-known species groups the declining trends are relatively slow. In the different habitats, the greatest increase in the number of red-listed species will occur in shore habitats (Auvinen et al. 2007).

The flora and fauna and the state of Finnish species are fairly well known. The checklists of known species in Finland are prepared and maintained by several actors. A further challenge is to get checklists of all species groups available on the Internet and update them regularly.

Several organisations and private researchers have datasets of species information. The Finnish Museum of National History maintains an easily accessible nature observation diary for the general public and naturalists (Hatikka; only in Finnish at http://www.hatikka.fi/) and a database, which includes approximately 5 million floristic data from herbarium specimens, literature and archives. There is a national initiative to digitize taxonomic data of the Finnish Museum of Natural History and regional natural history museums. The National Threatened Species Database is updated by the Finnish Environment Institute (SYKE). Significant resources are needed to store all known information on threatened species in the database so that they are available, for example, for land use planning. Information about the species database is available through the Global Biodiversity Information Facility (GBIF) network that is maintained by the Finnish Museum of National History, the GBIF portal in Finland. The main task in the future will be to develop a common, accessible species database for all users.

Under the Research Programme of Deficiently Known and Threatened Forest Species (PUTTE), the quality of the data in the threatened species database, as well as the knowledge of the biology and ecology of poorly known species groups, is improved. The project has been funded by the Ministry of the Environment annually with 1–1.6 million euros in 2003–2007. The threatened status of more than 2,200 species can now be assessed in 2010 compared to the assessment conducted in 2000. A new funding period has been recently opened for the years 2009–2016. Co-operation has been done with the Swedish *Svenska artprojektet* to prepare manuals for poorly known species groups.

To improve the knowledge of species distribution in protected areas, Metsähallitus is conducting extended inventories as a part of the METSO programme 2008–2016. There is still a need for better knowledge of species richness outside protected areas. There are also several projects on information exchange between different actors concerning species occurrences. The Finnish Environment Institute and Forest Development Centre Tapio have a co-operation project to exchange information about the known sites of

certain forest species and prepare management guidance for forest owners. Tapio's main task is to serve the Forestry Centres in Finland with systems for managing private forestry (see Appendix IIIA, GSPC report).

The protection and management of species and their habitats have been enhanced. Some 150 action plans for wild fauna and flora and management plans for several game species have been prepared.

The priorities in species conservation work were evaluated in a project supervised by the Ministry of the Environment in 2007–2008. On the basis of the project results and proposals from other previous projects, a national implementation programme or action plan for species conservation with conservation priorities and appropriate methods can be drafted in the future.

2.3.3 Case studies

Some successful projects contributing to the conservation and sustainable use of biodiversity are presented below. The goals of the METSO programme have been presented earlier (Chapter 2.2.1 Forests).

LIFE, the EU's financial instrument for environmental and conservation projects, has been used to fund several projects on the maintenance of biodiversity and nature management after 1995 when Finland became a member of the European Union. Some examples of successful LIFE-funded projects are mentioned in this report (see also Targets 3 and 5 of the GSPC report in Appendix IIIA).

Successful LIFE-funded projects

The LIFE project **'**Management of Wetlands along the Gulf of Finland Migratory Flyway**'** has aimed to preserve the valuable natural features of 12 wetlands within the Natura 2000 network which are used by birds migrating over the Gulf of Finland, and to help ensure the favourable conservation status of wetland species listed in the Birds and Habitats Directives. The project has particularly sought to improve the suitability of wetlands as staging areas for migrating birds.

The project was implemented under the coordination of the Uusimaa Regional Environment Centre (UUS) and the Southeast Finland Regional Environment Centre (KAS). UUS was responsible for the management work at 17 sites, while KAS looked after 812 sites.

The project, which was carried out in 2003–2006, is considered to have been very successful. The conservation objectives were met and even exceeded and all of the planned measures were duly implemented. The minor changes that had to be made to plans mainly concerned the extent or precise location of various schemes. Implementation costs remained within the budget, which, however, was exceeded by around 125,000 euros. The project facilitated the implementation of Natura 2000 sites in Finland and enhanced the conservation status of their wetland species and biotopes (transition mires and quaking bogs, boreal Baltic coastal meadows). Particularly, the numbers and species diversity of wetland birds using these sites as migratory staging areas have risen dramatically.

During the project, ten new management plans were drafted for all of the project sites not previously covered by such plans. During the project, many overgrown shore meadow habitats were restored through measures including the clearing of reed beds. Such schemes created 185 hectares of more open shore meadow habitats. Trees were also cleared from meadows and marshy shores with a total area of 87 hectares. The natural marshy state of such areas was restored by blocking or redistributing artificial drainage ditches. Such habitat restoration measures have affected a total area of some 76 hectares.

Small predatory mammals were actively eradicated at all sites. Altogether 400 minks and 1337 raccoon dogs were eliminated. This work involved close collaboration with local game management districts and valuable help from local hunters. One innovative ecological scheme conducted at Jaala Bay in Pyhäjärvi and Pappilansaari–Lupinlahti Bay involved the excavation of a total of 40 pools to provide suitable habitat where the larvae of large whitefaced darter dragonflies (*Leucorrhinia pectoralis*) can develop undisturbed.

Recreational facilities at the wetland sites were improved by building birdwatching towers, duckboard trails and information boards. Information boards describing the natural features of the seven wetlands and conservation goals were erected at each of the project sites. A total of 14 birdwatching towers were built, attracting considerable publicity and positive feedback. The new towers have helped to attract more visitors to many of the sites.

Guides and educational materials have helped to make more people aware of the wetlands and their value as places to visit and for educational purposes. Sets of wetland cards and a guidebook about visiting wetlands were distributed to every primary school in the provinces of Uusimaa and Southeast Finland (380 copies in all) and to nature schools. During 2005 nine public-guided excursions with wetland themes were organized in the Helsinki area as part of an annual scheme run by the local authorities. A further 15 public wetland excursions were organized to coincide with BirdLife Finland's annual 'battle of the towers' birdwatching event.

Public meetings were held as part of management planning procedures for all of the sites where new plans were drafted. Three public meetings were also held to provide information about the whole project, and local newspapers and radio stations were provided with plenty of information at various stages.

One important way to safeguard the biodiversity of Finland's mires is to actively restore habitats in the most ecologically valuable protected mires. Spruce mires and rich fens, for instance, need ~~attention for~~ more effective protection and more of these habitats need to be restored. Problems related to maintaining natural hydrological conditions must be addressed in land use and management plans drawn up for protected mires. The national mire and peatland strategy, which will be finalized in 2010, is an important tool for ensuring that peatlands and mires are restored and used sustainably.

Habitat restoration plans have been implemented for restoring and safeguarding wetlands with rich biodiversity. The impacts of previous restoration measures need to be monitored to ensure that successful management methods are continued.

Restoration of boreal forests and peatlands in Finland

There are former commercial forests and drained peatlands in many protected areas in Finland. The conservation state of these areas is improved by restoration. The most important methods of **forest restoration** are controlled burning, increasing the volume of dead and decaying wood, and diversification of the forest structure by making small clearings for saplings of deciduous trees. One of the most frequent restoration methods in herb-rich forests is the removal of coniferous trees. **Peatlands** have been restored by filling the ditches. Additionally, a broad monitoring network has been established to monitor the effects of restoration on biodiversity.

The positive effects of restoration activities on biodiversity have been remarkable. Herb-rich forest restoration has had a positive effect on populations of the white-backed woodpecker, which is a critically endangered bird species in Finland and also an umbrella species. Forest restoration has also increased significantly populations of the threatened saproxylic beetle and the number of fungus species in restored sites. The first results of monitoring show mainly positive signals (e.g. a rise in the water table) about the effects of peatland restoration. All the results also highlight the importance of carefully planned long-term monitoring.

Some 30,000 hectares of forests and peatlands were restored by the end of 2008. The target is to restore 25,000 hectares of forests and peatlands in the years 2009–2016. Approximately 11 million euros have been used for restoration activities from 2005 to 2009. It is estimated that in 2010–2014 about 8 million euros will be used.

The first assessment of threatened habitat types in Finland was carried out as a large collaboration work of national experts in 2005–2007. The results of the assessment and the proposals for action in order to improve the state of habitat types were published in 2008. A total of 368 habitat types were described and classified according to their risk of decline and deterioration. The proposals for action will be further developed in co-operation with stakeholders by setting up a working group under the widely based body responsible for the monitoring of the implementation and effects of the National Biodiversity Strategy and Action Plan. Future work includes, among other things, specifying proposals for legislative development work and for guidelines in land use planning. The project also aims at increasing the knowledge of habitat types, for instance, by producing GIS datasets on habitat types and by improving communication between administrative bodies and other organisations.

During **the First Assessment of Threatened Habitat Types in Finland** some 400 habitat types were classified according to their risk of human-induced decline and deterioration. Of the total number of habitat types, 51% were classified as threatened in the whole country. The corresponding percentage is lower in terms of area, as many of the threatened habitat types typically cover a small area.

The assessment considers all natural habitat types, which are divided into seven main groups: the Baltic Sea and its coast, inland waters and shores, mires, forests, rocky habitats, traditional rural biotopes, and the fell area. The assessment was carried out by seven corresponding groups of national experts. In all over 80 experts from different organisations participated in the project. The expert groups also compiled the first list of the habitat types for whose protection Finland has a particular international responsibility.

The red listing of habitat types was carried out on the national level, and on the regional level separately for southern and northern Finland. The proportion of threatened habitat types is much higher in southern Finland as compared to northern Finland. This can be explained by the clear difference in the intensity of land use between these regions.

The most significant reasons for habitat types being threatened are forestry, drainage for forestry (ditching), eutrophication of water bodies, clearing of agricultural land, and water engineering. The proportion of threatened types is highest among traditional rural biotopes and forests, while it is lowest in rocky habitats and in the fell area.

The expert groups have given proposals on measures to be taken in the future to improve the state of the habitat types. The 70 proposals made by the expert groups act as a starting point in a separate and broadly based process, which is will be started later and will put the results of the assessment in action.

Improvement is needed on many levels: international co-operation is essential in questions of climate change and eutrophication of the Baltic Sea. Regional planning holds a key position in improving the state of inland waters, mires and forests. Small-scale habitats can also benefit from carefully planned management, protection and land use steering. Landowners and owners of holiday homes can do their part, for example, by managing meadows or preventing overgrowth of sand beaches.

The Finnish National Forest Programme 2008–2015 aims at promoting sustainable forest management and preserving biodiversity, among other things. It was prepared through broad-based collaboration between different stakeholders and drew upon Regional Forest Programmes. The programme will be implemented in 2008–2015, taking into account changes that may be necessary due to monitoring, mid-term evaluations or Government policies.

Finland's National Forest Programme 2015

Finland's National Forest Programme 2015 (NFP) was adopted as a Government Resolution on 28 February 2008. It aims to increase the welfare of Finnish citizens through the diverse use of forests in compliance with the principles of sustainable development.

The underlying idea in the programme is that forest-based manufacturing and service production can be expanded while securing the social acceptability, economic viability and ecological, social and cultural sustainability of the forest sector. As production in the forest sector must be market-oriented and based on customer needs, the private sector has a vital role to play. It is the task of the public sector to create such preconditions that forests can be managed in a competitive way.

The purpose of the National Forest Programme is to *increase welfare from diverse forests*. The vision, or target state, of the programme is set for 2015, when *Finland is a world pioneer in sustainable forest management, the competence of the sector has been refined into new competitive products and services, the use of domestic wood has increased significantly and forest biodiversity has improved.* The role of forests in energy production and the mitigation of climate change occupy an important place in the programme.

Finland's National Forest Programme 2015 is constructed upon six priorities:

- Securing a competitive operating environment for the forest industry and forest management;
- Enhancing the climate- and energy-related benefits of forests;
- Protecting the biological diversity and environmental benefits of forests;
- Promoting the use of forests as a source of culture and recreation;
- Strengthening skills, expertise and acceptability of the forest sector;
- Promoting sustainable forest management in international forest policy.

Each priority has its own objectives and measures to attain them have been proposed.

The programme was drawn up in broad-based collaboration with interest groups steered by the Department of Forestry of the Ministry of Agriculture and Forestry and with support from the National Forest Council. The work involved representatives from Finnish ministries, forest administration, research and education, forest owners, forest industry, environmental organisations, employee organisations, entrepreneurs, and youth and leisure organisations.

The preparation of Finland's National Forest Programme 2015 has made use of Regional Forest Programmes for 2006–2011 drawn up by the Forestry Centres for their territories in a participatory process and with support from the Regional Forest Councils. As background information for the preparation of the programme, the Ministry of Agriculture and Forestry commissioned the Finnish Forest Research Institute (Metla) to prepare a report on the future of the forest sector, in addition to which other future reviews were used in the process.

Many relevant strategies and guidelines, either in preparation or approved by the Government, were taken into consideration, for example, the National Strategy on the Preservation of Biodiversity and Sustainable Use of Nature and the National Energy and Climate Strategy. In parallel with the NFP, a Forest Biodiversity Programme for Southern Finland 2008–2016 (METSO) was prepared and it is an integral part of the forest programme.

Furthermore, in parallel with the preparation of the NFP, an external *ex ante* evaluation of the programme was carried out. The evaluation also included the environmental impact assessment of the preparation and content of the programme.

The implementation of the programme is coordinated by the Ministry of Agriculture and Forestry, supported by the National Forest Council and its secretariat. The NFP is financed by seven ministries and the private sector. The Ministry of Agriculture and Forestry will prepare a revised action plan that specifies the responsibilities for the implementation of the programme, actors, schedule and Government funding. The Forest Council will modify the action plan on a yearly basis.

The NFP will be implemented in 2008–2015, taking into account any changes that may be necessary due to monitoring, mid-term evaluations or Government policies. The Regional Forest Programmes for 2006–2010 was revised to bring them in line with the National Forest Programme by autumn 2008.

2.4 The conservation and sustainable use of genetic resources

2.4.1 Plant genetic resources

The cultivated plants that thrive in Finland are genetically adapted to long, cold winters, and to a short growing season with long days. Landrace stocks of field crops and older species are no longer cultivated due to changes in agricultural practices, as their yields are poorer than those of modern varieties. Genetic resources of crop plants are generally conserved as seeds in gene banks in freezers (*ex situ* conservation). Such techniques enable the longer term conservation of living seeds of barley, wheat, oats, rye and lawn grass for decades.

The second State of Plant Genetic Resources for Food and Agriculture in Finland was submitted in 2008 to the United Nations Food and Agriculture Organization (FAO). The second Finnish National Report includes a description of the state of plant genetic resources concerning material under both Nordic and national management. An attempt was made to describe the trends regarding changes in the operational environment, conservation and use since 1996. The report has been compiled under the National Plant Genetic Resources Programme of Finland in cooperation with the Nordic Genetic Resource Center. The work has been steered by the National Advisory Board for Genetic Resources.

At the Finnish national level, a major improvement since 1996 was the launching of the National Plant Genetic Resources Programme for Agriculture and Forestry in 2003. The programme covers plant genetic resources both for agriculture and horticulture and for forestry.

In situ and *on farm* conservation crops and the wild relatives of crop plants are of great national interest. The o*n farm* conservation of locally adopted crops increases diversity in fields and gardens. The management of landraces and wild relatives of crop plants in the changing environments also provides evolutionary potential for the future. Activities to enhance the *on farm* conservation of crops have been initiated, but great challenges remain regarding the *in situ* conservation of crop plants' wild relatives.

The *ex situ* conservation of plant genetic resources of seed-propagated crops, including potato and their documentation, was carried out by the Nordic Gene Bank (NGB) until 2007. From the beginning of 2008 the three sectors of genetic resources in the Nordic area were reorganized and merged. The new Nordic Genetic Resource Center (NordGen) now covers plants for food and agriculture, forestry and farm animals.

On the recommendation of the Nordic Council of Ministers, access to plant genetic material of Finnish origin at NordGen is free, and the administration is shared by all Nordic countries. NordGen is located in Alnarp in Southern Sweden, and it has some 1,600 frozen seed samples from Finland, as well as a collection of Nordic potato varieties. Plant species that propagate vegetatively, like fruit trees, berry bushes, ornamental plants and perennials, are conserved in national field gene banks and in laboratory conditions (*ex situ* conservation). MTT Agrifood Research Finland and its network provide most of the necessary facilities for such work in Finland (see Appendix IIIA, Target 9).

The guiding framework for the access and benefit-sharing policy for all genetic resources in Finland has been the declaration by the Nordic Council of Ministers on the Nordic approach to access and rights to genetic resources (Kalmar Declaration, 2003).

In international forums Finland has supported the activities of the FAO and the CBD. The International Treaty of Plant Genetic Resources for Food and Agriculture (IT-PGRFA) is seen as a mechanism that allows the access and benefit-sharing arising from the use of plant genetic resources. Furthermore, the activities

of the CBD in promoting national biodiversity strategies and action plans have been valuable. Regional activities within Europe (European Co-operative Programme for Plant Genetic Resources – ECPGR) and in the Nordic area have benefits in task-sharing in the conservation of genetic resources. (For more information see: State of Plant Genetic Resources for Food and Agriculture in Finland, Second Finnish National Report, Ministry of Agriculture and Forestry 5/2008, published by Vammala 2008.)

2.4.2 Forest genetic resources

Forestry in Finland is based on local, native tree species. The conservation of the genetic resources of forest trees is part of the Finnish National Programme for Plant Genetic Resources for Agriculture and Forestry (see above). A network of gene reserve forests has been established to conserve forest genetic resources. The network today covers about 7,200 hectares. *Ex situ* conservation is also used and involves the use of forest genetic resource collections (especially broad-leaved trees), transplantations and a seed bank.

The management of genetic resources also includes proper use and trade of forest reproductive material, which is governed by various statutes and a tree-breeding programme.

International co-operation is organized within Europe through the EUFORGEN Programme, and in the Nordic countries through the Nordic forest tree genetic resources network of the Nordic Genetic Resource Center (NordGen).

2.4.3 Animal genetic resources

Each country has to look after its own animal genetic resources, and the FAO is monitoring the fulfilment of the CBD. In the first phase, the FAO is collecting information on the national programmes for animal genetic resources. The Ministry of Agriculture and Forestry nominated a working group for animal genetic resources in December 1998. The working group had to deal with conservation and sustainable use and international collaboration for genetic resources of animals in food and agricultural production. Finland handed over to the FAO a report on activities on animal genetic resources in January 2004. The report was prepared in collaboration with national organisations responsible for different animal species. The information in the national report is included in the first State of the World's Animal Genetic Resources for Food and Agriculture (FAO 2007).

The working group for animal genetic resources decided at a meeting in 2001 that the preparation of the report should be extended to writing a national programme for farm animal genetic resources. Of the farm animal species, the working group defined the programme to cover bees, cattle, chickens, dogs, fur animals, goats, horses, pigs, reindeer and sheep. The main objectives in the programme are to encourage the maintenance of an internationally competitive position of animal breeding programmes, the conservation of indigenous breeds, and research. The selection and maintenance of variety is used to improve qualityin animal production, security of supply and diversity of production. Active publicity and education are used to increase the awareness of animal genetic resources and the need to maintain them. The programme and the supporting research operate in a network with NordGen and the FAO's global programme on animal genetic resources and co-operate with international research teams.

The principle of sustainable use of resources is the goal of animal breeding organisations. The work is coordinated by MTT Agrifood Research Finland. Conservation is carried out through *on farm* conservation of animals and cryo-conservation of semen and embryos. The National Advisory Board for Genetic Resources monitors the progress of the programme for animal genetic resources.

2.4.4 Genetically modified organisms

Impacts on biodiversity should be considered whenever decisions are taken to permit the cultivation and marketing of genetically modified (GM) products in accordance with national and European Community

legislation. Finland's national positions are defined according to established procedures. The Gene Technology Board is responsible at national level for taking into consideration public opinion on field trials involving genetically modified organisms (GMOs) and, in some cases, also their confined use. The ministries concerned use various forums to inform the public about the use of gene technology in their respective sectors, and about the related risk evaluations and risk management. The National Advisory Board on Biotechnology, whose members include the representatives of many stakeholders, also provides the public with wide-ranging information on biotechnology and gene technology issues.

In the future suitable new indicators will be developed to enhance monitoring of the functioning and impacts of GMOs and to evaluate positive and negative impacts on human health. The responsible ministry is the Ministry of Social Affairs and Health.

As part of the EU-level development of monitoring methods, Finland is examining the applicability of existing environmental indicators for assessing the impacts of GMOs. The need to develop new GMO-specific indicators will be defined in more detail according to the future availability of GM products in national markets.

The Ministry of Agriculture and Forestry and the Ministry of the Environment funded the Academy of Finland's Research Programme on Environmental, Societal and Health Effects of Genetically Modified Organisms 2003–2007 (ESGEMO Programme). Issues under examination included risks to natural and agricultural environments, and the socio-economic impacts of the use of GMOs. Projects within the programme also focused on the environmental risks associated with genetically modified forest trees. The programme's findings clearly show that certain key issues still need to be further studied within the frameworks of other research programmes. Genetically modified products are not yet available on the market in Finland, but research work related to their possible impacts in the future is already ongoing.

The **Gene Technology Strategy and Action Plan** of the Ministry of Agriculture and Forestry was updated in 2009. The amendment of the Finnish Gene Technology Act in September 2004 brought into force nationally the regulations of the EU's renewed Directive 2001/18/EC on the deliberate release into the environment of genetically modified organisms.

2.4.5 Access and benefit-sharing (ABS)

In accordance with Decision IX/12 of the CBD/COP, the Access and Benefit-sharing Working Group is instructed to “Finalize the international regime and to submit for consideration and adoption by COP at its tenth meeting an instrument/instruments to effectively implement the provisions in article 15 and article 8 j of the Convention and its three objectives, without in any way prejudging or precluding any outcome regarding the nature of such instrument/instruments”. COP 10 will be held in October 2010, in Nagoya, Japan.

In line with the roadmap adopted for the negotiations of the international regime, it was ensured that the ABS working group will meet three times before the 2010 deadline for completion of the negotiations. The COP also established expert groups for getting the ABS regime moving and finalized.

Finland as an EU member state is actively taking part in the finalisation of the ABS regime. The National Advisory Board for Genetic Resources set up a subcommittee in 2004 to consider the objectives and national implementation of the Bonn Guidelines. In 2006 the subcommittee completed its background report for the national implementation of the Guidelines on access to genetic resources and benefit-sharing. National legislation on ABS has not been drafted due to the Nordic free access policy adopted by the Nordic Ministers' in 2003 and the Everyman’s right policy in Finland (for more information, see: http://www.ymparisto.fi/download.asp?contentid=25603). Finland is still considering which approach it will take in the future, but any decision will be in line with international developments and the EU approach. In deciding what kind of system needs to be created and what instruments need to be employed to fulfil the ABS requirements, two important issues are the possible obligation to seek the prior informed consent (PIC) of the country providing genetic resources and the principle of mutually agreed terms (MAT).

Furthermore, because of our indigenous Saami people, the applicable provision of the CBD requires national coordination and co-operation with stakeholders. Finland will decide in reference to Article 8(j) on which kinds of instrument it will use to achieve the objectives of the CBD in order to be in line with the ABS regime and the EU line taken in the future. Additionally, the Nordic co-operation on and common approach to genetic resources is important, for instance, in the work of NordGen. (For more information, see www.norden.org.)

Articles to raise public awareness have been published; the latest is an e-newsletter on genetic resources put out in 2009 (see, TEKES: http://www.bioteknologia.info/etusivu/fi_FI/tervetuloa/).

2.5 Cross-cutting measures

2.5.1 Building up an improved knowledge base

Biodiversity Monitoring

Biodiversity research and monitoring are essential prerequisites for successful conservation and sustainable use of biodiversity. Biodiversity monitoring was dealt with in its own section in the second (in 2001) and third Finnish national report (in 2005) (http://www.cbd.int/reports/), so it will not be discussed here in detail. It is enough to say that biodiversity monitoring in Finland is comprehensive and consists of 57 different monitoring schemes, but it has not been consistently coordinated. Additionally, reporting on the state and trends in biodiversity has been done in separate reports by various actors.

In 2006 a joint project 'Developing a biodiversity indicator collection for Finland', financed by the Ministry of the Environment, was launched to develop a comprehensive indicator set for biodiversity in Finland. The project is coordinated by the Finnish Environment Institute (SYKE), and conducted with the aid of governmental research institutes (Finnish Forest Research Institute, Finnish Game and Fisheries Research Institute, South Karelia Allergy and Environment Institute), other organisations (Finnish Museum of Natural History, Metsähallitus) and NGOs (Birdlife Finland). The indicator collection is intended to give a general platform for presenting results of the biodiversity monitoring in Finland. Indicators produced by the project are presented on a special Internet site (www.biodiversity.fi, in English, and www.luonnontila.fi, in Finnish). The indicators presented in this report are mostly based on this work.

Biodiversity research

A fair amount of biodiversity research has been conducted in Finland, and there are several high-quality research groups in the country, particularly in the area of conservation biology. Much of this developed because of two research programmes, FIBRE and MOSSE.

The Finnish Biodiversity Research Programme FIBRE (1997–2002) was an important groundbreaker for biodiversity research and a serious attempt to deliver research data to end-users. The evaluation of the programme stated that the research programme contributed substantially to capacity building and exhibited very high quality research. However, in terms of the societal impact of the programme, the evaluation report concluded that there were some clear weaknesses related to the degree of the interdisciplinarity and applicability of the results (Publications of the Academy of Finland 3/03. Finnish Biodiversity Research Programme FIBRE 1997–2002. Evaluation report).

MOSSE, a more applied research-oriented programme, financed mainly by the Ministry of Agriculture and Forestry and the Ministry of the Environment, ran between 2003 and 2006 and included more than 60 projects. Dissemination of the research results was an integral part of MOSSE throughout the course of the programme. Interim results were reported in 2005 and final results in 2006 (Auvinen et al. 2007).

The report from the ad hoc task force on coordination of environmental research in Finland recommended that the societal impact of biodiversity research and its relevance for decision-making should be further improved (Road map for environmental research to aid in decision-making, Ministry of the Environment 2007). This report also makes several recommendations as regards biodiversity research. In particular, research programmes that are solution-oriented and support decision-making should be launched, for example, on urban ecology and biodiversity.

Besides national research, Finland has actively participated in the European Union's framework research programmes in biodiversity research. As an example, activities of researchers at the Finnish Environment Institute (SYKE) will be presented here. The effects of land use changes on biodiversity was the main focus of the Specific Targeted Research/Innovation Project "COCONUT" (Understanding effects of land use changes on ecosystems to halt loss of biodiversity due to habitat destruction, fragmentation and degradation, 2006–2009), which included researchers from nine European countries.

During this project, the Finnish Environment Institute was responsible for preparing a review article on the empirical evidence existing for an extinction debt and the challenge that time-delayed extinctions pose for biodiversity conservation across a wide range of species and ecosystems (see article in Trends in Ecology and Evolution). Further work on extinction debt was based on collecting empirical data on land use changes and grassland plants and butterflies from Finland, Estonia, Sweden, Germany and Spain. The results showed that following the loss of semi-natural grasslands there was substantial extinction debt in plants (with expected extinctions delayed for > 40 years), but not in butterflies, presumably because the extinctions caused by habitat loss take place much faster in the short-lived butterflies than in the longer-lived plants. The Institute was also active in combining results of existing studies on the effects of habitat loss and fragmentation on biodiversity. This work produced several research papers synthesizing knowledge on the significance of habitat area and connectivity, matrix quality and species traits, and habitat loss on plants, butterflies and wild bees.

Finland has also participated in the network of excellence for long-term biodiversity research, the ALTER-Net, from 2005 to 2009. The project facilitated, among other things, the development of the European-LTER network for long-term ecological research. This catalyzed the formation of a national LTER-network for Finland, the FinLTSER (www.environment.fi/syke/lter). In LTSER platforms, socio-ecological research is being carried out. In addition, ALTER-Net has researched, developed and promoted integrated, interdisciplinary research which aims to support the present and future knowledge needs of decision-makers in the field of biodiversity. One of the outcomes is a framework for interdisciplinary research which has been used for analysing the need for knowledge in bioenergy–biodiversity interlinkages (http://www.ymparisto.fi/default.asp?contentid=321365&lan=en). After the ALTER-Net project phase had ended, most partners signed a memorandum of understanding to continue the network collaboration. Finland had an important role in the ALTER-Net project, especially with the LTSER platforms and in development of the interdisciplinary research.

Finland also participated in the EU 6th framework Integrated Research Project 'Assessing Large-scale environmental Risks with tested Methods' (ALARM, 2004–2009). The project was coordinated by UFZ, Germany. The aim of ALARM was to develop and test methods and protocols for the assessment of large-scale environmental risks in order to minimize negative direct and indirect human impacts, with a particular focus on risks arising from (1) climate change, (2) environmental chemicals, (3) biological invasions, and (4) pollinator loss, interactions between these factors and the underlying socio-economical drivers. The research carried out at the Finnish Environment Institute focused on the climate change–biodiversity and ecosystems processes, but also a number of cross-cutting research issues (climate change–invasive species interactions) were tackled.

2.5.2 Research infrastructures and plans to develop governmental research institutes

In the longer term, high-standard and up-to date research infrastructures are a precondition for successful research. They are also highly significant for the international competitiveness of the research system and for the interest in it. Following the recommendation given in the Science and Technology Policy Council's

report in 2006, Finland's Ministry of Education in association with the Ministry of Trade and Industry (now Ministry of Employment and the Economy) appointed a committee which was entrusted to prepare a report on the present state of national-level research infrastructures and a roadmap for their further development. In its report (2009; see also www.edu.fi) the collections of the Natural History Museum of the University of Helsinki were identified as the existing research infrastructure. Three other infrastructures were included in the roadmap with an option to develop them as research infrastructures: ENVIDAT, including the e-science and technology infrastructure for biodiversity data and observatories, the FinLTSER network, and the international LIFE WATCH initiative (www.lifewatch.eu), which also belongs to the European research infrastructures (ESFRI). If these infrastructures are supported they will provide good opportunities for developing biodiversity research and monitoring, and for developing other bodies such as the Global Biodiversity Information Facility (GBIF).

Finland has several strong sectoral research institutes under different ministries. There are concerted attempts to increase integration within their research activities. For biodiversity research this means more integration with research on other environmental sciences, with research on natural resources and with socio-economic research.

The integration of marine research with other environmental research also resulted in organisational changes. At the beginning of 2009, the biological and chemical research of the Finnish Institute of Marine Research was merged into the Finnish Environment Institute (SYKE) in order to effectively combine the expertise of these two institutes. The marine research branch (Marine Research Centre) of the Environment Institute will study trends in the state of the Baltic Sea, including eutrophication, the ecology and functioning of marine ecosystems, marine biodiversity and invasive species. The Environment Institute, the Ministry of the Environment and the Finnish Meteorological Institute will continue to collaborate on the running of the Baltic Sea Portal to ensure the availability of comprehensive up-to-date information about the Baltic Sea, current trends, marine research and related projects.

As a result of discussions on the integration of environmental sciences and research on natural resources, it is likely that an environmental and natural resources consortium will be established. This initiative is a strategic alliance of the main government research institutes in these fields, with the main actors being the Finnish Forest Research Institute (Metla), MTT Agrifood Research Finland, the Finnish Game and Fisheries Research Institute (RKTL) and the Finnish Environment Institute (SYKE). The number of staff involved in the alliance is close to 3,000 persons, including more than 1,000 academic researchers. This arrangement has great potential for developing biodiversity research and monitoring in the future.

2.5.3. Reporting in accordance with the EU Habitats Directive

EU member states report to the European Commission every six years on their implementation of regulation under the Habitats Directive, as specified in Article 17 of the directive. Finland's report for the period 2001–2006 for the first time evaluated the conservation status of all of the habitats and species of European Community importance (as listed in the directive's annexes) across the whole country. The Habitats Directive aims to ensure that these habitats and species all have a favourable conservation status.

The report categorises the conservation status of habitats and species in Finland as follows:

- Favourable (FV, green)
- Unfavourable-inadequate (U1, yellow)
- (Unfavourable-bad (U2, red)

In cases where the available data were seriously deficient, the status has been categorised as:

- Unknown (XX, grey)

Habitats: In the boreal region only 14% of habitats were categorised as having a favourable conservation status, 50% as unfavourable-inadequate, and 36% as unfavourable-bad (Figure 2). In Finland's alpine region 88% of habitats were classified as favourable, and only 12% as inadequate. These figures relate to the proportion of the total number of habitats in each category, and not their surface area. Habitats categorised as bad include meadowlands and other habitat types associated with traditional agricultural

practices, whose share of Finland's total surface area is considerably smaller than their numerical proportion of the listed habitat types. But some of the other inadequate status habitat types cover extensive areas – such as natural boreal forests and aapa mires. The situation is most favourable for arctic fell habitat types and rocky habitats.

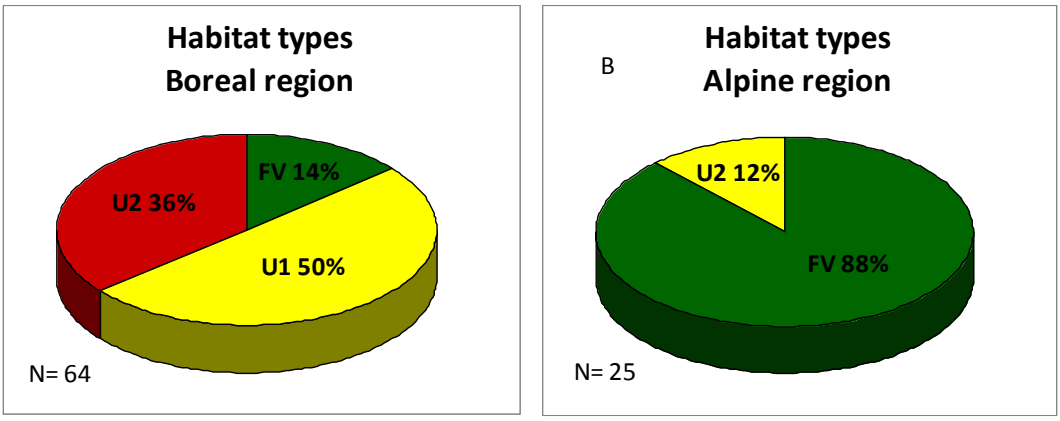


Figure 2. Conservation status of habitats listed in the Habitats Directive in the boreal region (Figure 2A) and alpine region (Figure 2B). FV = favourable, U1 = unfavourable-inadequate, U2 = unfavourable-bad. Source: www.ymparisto.fi.

Species: In the boreal region 38% of species were categorised as favourable, 39% as unfavourable-inadequate, 10% as unfavourable-bad, and 13% as unknown (Figure 3). Species with favourable status include most fish species and game species. Typical examples of inadequately conserved species include many beetles associated with old-growth forests, and species with unfavourable status include the Saimaa ringed seal and many plants and insects associated with eskers and traditional agricultural habitats. Species whose status is unknown include many bats and certain molluscs.

In the alpine region 70% of species have favourable status, 9 % have unfavourable-inadequate, 6% have unfavourable-bad, and 15% are unknown. Only two species are categorised as bad (arctic fox and wall hawksbeard), and three as inadequate (the butterfly *Erebia medusa polaris*, the moss *Encalypta mutica*, and reindeer lichen).

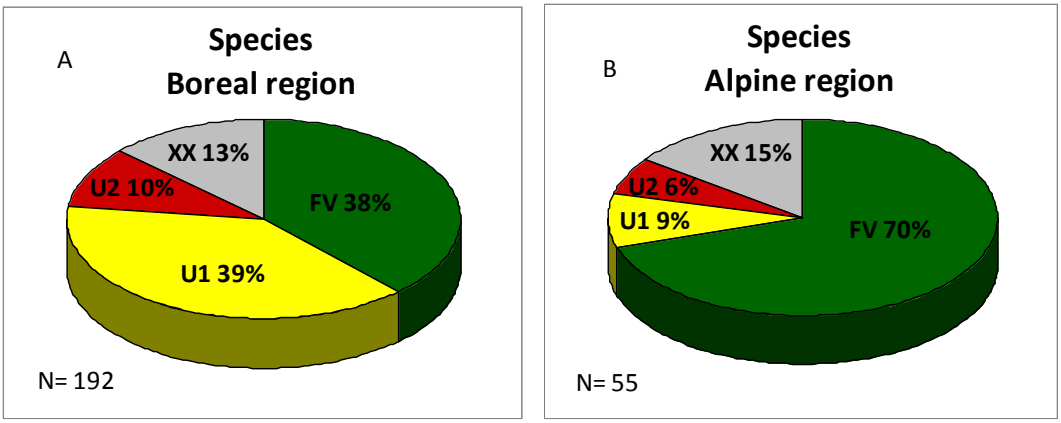


Figure 3. Conservation status of species listed in the Habitats Directive in the boreal region (Figure 3A) and alpine region (Figure 3B). FV = favourable, U1 = unfavourable-inadequate, U2 = unfavourable-bad, XX = unknown. Source: www.ymparisto.fi.

2.5.4 Impacts of climate change on biodiversity

The impacts of climate change on Finnish nature cannot yet be fully estimated. Longer growing seasons and milder winters may lead to a rapid proliferation of a number of southern species that thrive in warm climate conditions. The total number of fauna and flora in Finland will probably increase. However, northern species requiring cold conditions will suffer from the change as habitats suitable for them become rarer.

Well-documented changes in nature in Finland because of climate change are marked increase of tree growth in forests (Kellomäki et al. 2008), earlier spring migration and breeding of many birds (Ahola et al. 2004), range shifts of many birds northward (Brommer 2004), and expanding northern range limits of butterflies and moths and greater likelihood of multivoltinism in moths (Pöyry and Toivonen 2005).

A recent Finnish study (Pöyry et al. 2009), conducted under the EU-funded ALARM project (see www.alarmproject.net) analysed changes in the northern boundaries of the ranges of 48 butterfly species in Finland during two time periods: 1992–1996 and 2000–2004. The results show that butterflies shifted their northern range limits by almost 60 kilometres, which exceeds all previously reported figures for insects worldwide. These observations suggest that recent climatic warming during the last ten years in Finland has had a strong influence on butterfly ranges. The ability to move northwards varied, however, among the butterflies, being most clear in common species with a good flying capacity and food preferences for common plants. In contrast, rare and threatened species living in patchy grassland environments were not as successful in moving northwards.

The impacts of climate change on habitat types were expertly assessed in the first assessment of threatened habitat types in Finland (Raunio et al. 2008. Assessment of threatened habitats in Finland. Part I. Results and basis for assessment. The Finnish Environment 8/2008). According to the assessment, climate change raised the threatened status of many habitat types, but its effects are estimated to markedly increase in future, often in combination with eutrophication and overgrowth of vegetation.

For example, climate change will in the future be a major threat to many of the marine and coastal habitats of the Baltic Sea because a rise in sea level will likely cancel out the land uplift along the coasts, and because of changes in ice conditions, precipitation, salinity, and invasive species. Additionally, many mire habitat types, particularly in the north, are affected by climate change. In the long run climate change will cause great changes in forest ecosystems. The northern range of many forest species can shift more than 500 kilometres northwards during this century, and many temperate species may increase in Southern Finland. Broad-leaved deciduous trees will become more common, and conifers, particularly the Norway spruce may dominate in northern areas. The disturbances in forests due to pests and diseases and also storms will increase. These changes will take several decades, however, and they are largely dealt with in forest management practices and other land use.

The impacts of climate change may be most prominent in northern fell areas, and according to the expert assessment, climate change may be a serious threat to the majority of the habitat types in the northernmost Finland, particularly those habitat types with frozen soil conditions and long-lasting snow cover. The most evident change will be a rise in the tree line and a decline in open alpine habitats. Even with the least severe scenario with a +2 degree Celsius rise in the global mean temperature until the year 2100, the tree line will move upwards by at least 350 metres. This means that open alpine habitats will occur only in the northwestern parts of Finnish Lapland (see Fig. 4).

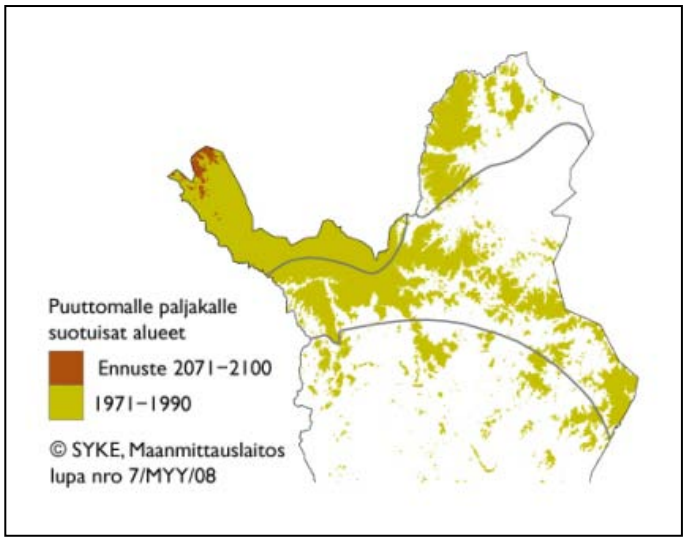


Figure 4. Future occurrence of the climate conditions which are characteristic of open alpine (fell) areas. According to the climate conditions in 1971–1990, open fell areas occurred in areas situated over 300 metres above sea level. These areas are marked in green on the map. The areas marked in red are those where in 2071-2100, according to a future climate scenario, the climate conditions are estimated to be characteristic of open alpine areas (Raunio et al. 2008).

Biodiversity and adaptation to climate change and related research

Finland was one of the first countries in Europe to adopt a national adaptation strategy in 2005. The adaptation strategy presents in great detail the anticipated impacts of climate change in different sectors and also sets out measures to be taken until 2080. The objective of the strategy is to improve the capacity of society to adapt to the changes ahead. Through mainstreaming, both the Government and other stakeholders will take further action to promote adaptation. The strategy is part of the National Energy and Climate Strategy adopted in 2006. The Ministry of Agriculture and Forestry is responsible for coordinating the implementation of the Adaptation Strategy. The Strategy will be implemented in 2005-2012 primarily through sector-specific strategies and programmes. It was evaluated in 2009 and will be revised in 2011–2013.

Priorities identified in the adaptation strategy for better implementation include:

- mainstreaming the impacts and adaptation into sectoral policies
- addressing long-term investments
- coping with extreme weather events
- improving observation systems
- strengthening the research and development base
- international cooperation

The adaptation strategy covers the following sectors:

- Agriculture and food production
- Forestry
- Fisheries
- Reindeer husbandry
- Game management
- Water resources
- Biological diversity
- Industry
- Energy
- Transport and communications
- Land use, communities, buildings and construction
- Health
- Tourism and recreational use of nature
- Insurance operations

The adaptation strategy made 21 recommendations for possible measures that could facilitate the adaptation of natural biota to climate change, including the monitoring and development of the protected areas network, the restoration of habitats, the conservation and management of species important for biodiversity, and the eradication of harmful alien invasive species. The goals and methods applied in protected area management may need to be revised in the future.

The findings of the national adaptation strategy were discussed in the first multi-sectoral research project in Finland on adaptation 'FINADAPT' (www.environment.fi/syke/finadapt). FINADAPT was a consortium of 11 partner institutions. Studies were carried out during 2004–2005 through literature reviews, interactions with stakeholders, seminars, and targeted research. FINADAPT addressed many sectors and topics: climate data and scenarios, biological diversity, forestry, agriculture, water resources, human health, transport, the built environment, energy infrastructure, tourism and recreation, a socio-economic preparatory study, urban planning, and a stakeholder questionnaire.

FINADAPT WP3, which concerned biodiversity (Pöyry and Toivonen 2005), analysed findings and measures suggested in the national Adaptation Strategy. The study was based on a literature survey and an expert questionnaire. The report drew attention to knowledge gaps concerning impact and adaptation research, including the regional modelling of relationships between climate change and biodiversity, the assessment of protected areas for the likely effects of climate change, and the identification of species and habitats at risk of being significantly affected by climate change.

A related project FINESSI (http://www.finessi.info/finessi/) was a three-year project funded by the Finnish Environment Institute during 2003–2006 to develop a computer-based evaluation framework for investigating the impacts of global change on various natural and managed systems in Finland.

A five-year research programme for 2006–2010 has also been launched to support the implementation of the national adaptation strategy. This 'Climate Change Adaptation Research Programme ISTO (2006-2010)' (http://www.mmm.fi/en/index/frontpage/environment/ilmastopolitiikka/researchprogrammeonadaptationtoclimatechange.html) was prepared in cooperation between Government ministries in 2005. About 25 projects are funded by the Ministries of the Environment, Agriculture and Forestry, and Transport and Communications. Work is done in co-operation with relevant research bodies and other parties with the aim to ensure a science–policy interface. A project under the ISTO programme focused on biodiversity: "Biodiversity and climate change: Efficiency of the network of nature reserves and grazed meadows in maintaining species' populations".

As part of the project "Vulnerability assessment of ecosystem services for climate change impacts and adaptation" (VACCIA), recommendations will be given on the need for and methods of *ex situ* conservation of plants in 2009–2010 (see Target 8 in the GSPC report, Appendix III). Under the projects MAVERIC (www.environment.fi/syke/maveric) and CARAVAN (www.environment.fi/syke/caravan), an assessment of the vulnerability to climate change will be carried out employing regional indicators.

In the EU-integrated ALARM project (see biodiversity research on Chapter 2.5.1), the Finnish Environment Institute contributed to investigating the 'fingerprints' of climate change on biodiversity of northern environments, developing methods for assessing the vulnerability of species to a changing climate, and examining the critical sources of uncertainty in bioclimatic envelope modelling in order to outline the most reliable ways to generate projections of future range shifts of species. Moreover, research was targeted to developing a methodological approach to conducting a global analysis of climate analogue areas for identifying areas potentially sensitive to introductions of invasive species and the most likely source areas within and outside Europe. Research was also targeted at investigating the likelihood and pace of degradation of northern palsa mires under different climate scenarios.

Several projects on the growth, health and biodiversity of boreal forest ecosystems are currently in progress under the research programme "Functioning of forest ecosystems and the use of forest resources in a changing climate" (MIL) (http://www.metla.fi/tutkimus/index-en.htm) of the Finnish Forest Research Institute.

The Finnish Environment Institute coordinated the PEER report on climate policy integration, coherence and governance in six European countries, which was published in March 2009. The results of the research show that climate change needs to be better integrated into other policies, such as economic, transport and agricultural policies, if climate change is to be tackled effectively. At present, along with targeted strategies, there is a special need to develop existing and new instruments through which policy integration can best be implemented. (See http://mmm.multiedition.fi/peer/peer_review_3/peer_news_climatepolicyintegration.php.)

2.5.5 Indigenous Saami people and traditional knowledge

The Saami are the only indigenous people of the European Union. In Finland, the definition of a Saami is laid down in the Act on the Saami Parliament and is mainly based on the Saami language. Traditional Saami livelihoods connected to their traditional ecological knowledge are reindeer husbandry, fishing, hunting, and collecting berries. In modern times also small-scale tourism has become a part of Saami livelihoods.

The Saami Parliament (Sámediggi) is the representative body of the Saami people. It was established by law at the beginning of 1996, thereby giving the Saami a constitutional right to self-government in their homeland in the spheres of language and culture. The Parliament's main purpose is to plan and implement the cultural rights guaranteed to the Saami as an indigenous people. The Saami elect the members of the Parliament. The Skolt Saami also maintain their tradition of village administration, under the Skolt Act, within the area reserved for the Skolt Saami in the Saami Homeland. The Saami Homeland is legally defined and covers the municipalities of Enontekiö, Inari and Utsjoki as well as the Lappi reindeer husbandry district in the municipality of Sodankylä.

There are about 9,000 Saami in Finland. More than 60% of them now live outside the Saami homeland, which brings new challenges for the provision of education, services and communication in the Saami language. The whole Saami population is estimated to be over 75,000, with the majority living in Norway. There are three Saami languages spoken in Finland: North Saami, which is the majority language, Skolt Saami and Ánar Saami, which is only spoken in Finland. The right of the Saami to use their own language before courts and other public authorities is granted in the Saami Language Act, which also contains provisions on the duty of the authorities to enforce and promote the linguistic rights of the Saami.

The traditional knowledge of the Saami has been embedded in the Saami language, culture and livelihoods as well as their exploitation of nature. Generally, the Saami are experts at reading nature and have a very special and distinct terminology for environmental conditions and phenomena. The Saami language has a vast store of terminology and appellatives for snow, reindeer, terrain, water and climate which provides confidence when navigating and moving in the landscape. There are about 1500–2000 terms related to reindeer husbandry, about 400 terms to describe the terrain, and over 300 terms for snow. Although linguistic knowledge is typically largely of a practical nature, it also holds more theoretical aspects in perception models, cultural ways of seeing, and in exact classification systems of natural phenomena, topography, terminology, and identification models.

As with other indigenous peoples, the Saami's traditional knowledge and its preservation are connected to traditional livelihoods and the use of the related language. The future transfer of traditional knowledge may be threatened by the social structures of northern communities and the education system, if such risks are not taken into consideration.

According to the Saami Parliament, in order to protect the Saami's traditional ecological knowledge, the present support system for reindeer husbandry should be developed in the direction of enhanced support of the nomadic husbandry practices and yearly rotation of grazing lands. (See also the Game animals and management Chapter 2.2.1. Game animals.)

Hunting and fishing are also important forms of livelihood in the Saami culture. Capturing willow ptarmigans by snares is highly culturally important. This method of capture is generally forbidden, but the

Bern Convention allows snares to be used north of latitude 58° N. The fluctuations of ptarmigan populations, however, threaten this type of hunting as a livelihood.

Finland's wilderness areas have been established to protect the wilderness characteristics of these parts of northernmost Finland, and also to safeguard Saami culture and traditional subsistence practices, while developing the potential for diversified sustainable use of natural resources. Finland has a specific Act on Wilderness Reserves (1991) under which wilderness areas are protected. The Wilderness Act prohibits major development that would change nature significantly, yet it is also aimed at improving opportunities for traditional uses of nature. This helps guarantee the rights of the Saami in pursuing their traditional lifestyles and reindeer husbandry regardless of the protection category of the area where they live.

With Article 8(j) of the CBD as a point of departure, the Ministry of the Environment has funded a study "Biodiversity and the Saami: implementing Article 8(j) in the Saami homeland". This study will give further insights into the Saami traditional ecological knowledge and how it can be safeguarded. The study was conducted in 2007–2008 by the Arctic Centre of the University of Lapland. In particular, the study reviewed what had been done and what should be done in Finland under the obligations of the CBD concerning the protection of indigenous traditional knowledge. Through examples and case studies the close relationship between traditional knowledge related to biological diversity and the Saami people's livelihoods is shown. The study also deals with the ownership of traditional knowledge and application of the Akwé: Kon Voluntary Guidelines in solving land use questions in the Saami homeland.

As a result of the study a number of recommendations for further work on the protection of traditional knowledge in Finland have been made:

- better safeguarding of preconditions for nature-based livelihoods in the Saami homeland;
- further enhancing of the collection of indigenous traditional knowledge with a view to establishing a database for that purpose;
- increasing and further development of education and training activities focusing on the Saami homeland, nature and biodiversity, Saami concepts of nature, traditional knowledge and practices;
- increasing inventories of the nature values of Saami holy sites and establishment of a database for holy sites and areas of traditional use;
- developing ethical guidelines for the use of Saami traditional knowledge;
- developing specific indicators for traditional use of nature and environmental change in the Saami homeland.

These recommendations were taken into account together with a number of other relevant tasks when a specific Article 8(j) expert working group was established by the Ministry of the Environment under the Finnish National Biodiversity Strategy and Action Plan Committee in 2009.

In the context of the Convention on Biological Diversity (CBD), Finland has continued to provide input into the work on biodiversity and climate change. The international expert meeting on responses to climate change for indigenous and local communities and their impact on traditional knowledge related to biological diversity in the Arctic region was convened by the Government of Finland in Helsinki from 25–28 March 2008, and included participants from throughout the Arctic region. The report of this meeting was presented as an information document to CBD/COP9 in May 2008 and its results are presented in a brochure. For details on climate change, see Chapter 2.5.4.

2.5.6 Biodiversity as an economic issue

Biodiversity is an important economic issue because it provides many direct and indirect benefits for society. Additionally, human activities are causing the decline in biodiversity, which in turn threatens the capacity of whole ecosystems to provide vital ecosystem services for mankind. The cost effects of harmful actions and the role of the private sector in the conservation and sustainable use of biodiversity are highlighted. Examples are presented of both successful and unsuccessful economic incentives in relation to their impacts.

The report "Biodiversity as an economic issue" examines the related economic linkages, the costs and benefits of safeguarding biodiversity, and the decline in biodiversity caused by economic activities. The study was conducted in 2006 on biodiversity as an economic issue and examined the related economic linkages, the costs and benefits of safeguarding biodiversity and the linkages between the economy and the preservation of biodiversity (www.environment.fi/lumonet/, The Finnish Environment 48/2006).

The results of the pre-study "The Economics of the State of the Baltic Sea", which was conducted by a consortium led by MTT Economic Research, together with the Finnish Environment Institute (SYKE), the Finnish Institute of Marine Research (FIMR), and the Fisheries and Environmental Management Group (FEM) of the University of Helsinki, was published in 2009. The purpose of the pre-study was to assess the feasibility of carrying out an economic analysis on the protection of the Baltic Sea in a similar manner as the economics of climate change were analysed in the Stern Review (2007). The working title for the pre-study was "Stern initiative for the Baltic Sea" (in Finnish "Itämeren suojeluskenaarioiden laatiminen Sternin mallilla", www.helcom.fi).

2.5.7 Business and biodiversity

The CBD acknowledges that the private sector can significantly contribute to achieving the Convention's objectives. In March 2006, a decision was adopted that focused on the engagement of the private sector. The significance of this sector was also acknowledged by the European Union in 2006. The CBD (CoP9) in May 2008 (Decision IX/26 – Promoting business engagement) noted with appreciation and welcomed the business and biodiversity efforts made to mobilize the business communities, and highlighted the "business and the 2010 challenge" for engaging business in biodiversity issues, as a means of working towards the 2010 target.

The Business and Biodiversity Conference, which was held in November 2007 in Lisbon, Portugal, brought together 400 high-level participants from business, governments and civil society. The resulting Message from Lisbon called on business, governments, the European Union and NGOs to:

• Continue raising awareness of the strong competitive advantage companies can gain from conserving biodiversity;
• Promote the use of market, corporate responsibility and regulatory schemes;
• Support business with operational tools for biodiversity conservation and measuring their performance in meaningful ways, especially in small and medium-sized companies; and
• Encourage new incentives to develop and strengthen partnerships between companies, governments at all levels, NGOs and academia.

Furthermore, it was noted that despite all initiatives by governments, NGOs, companies and consultants, it remains very difficult to truly involve the different business sectors in addressing biodiversity concerns.

In support of the implementation of the CBD, Finland is now undertaking a review of the biodiversity-related activities and opportunities of business and the private sector in Finland.

In addition, in support of the commitment of governments to reduce the loss of biodiversity by 2010 and to build on experiences, the Finnish Ministry of the Environment will prepare with other stakeholders and coordinate the B@B initiative, taking into account the CBD/COP9 decision, and will use the information at hand for developing a multi-stakeholder process and analysing commitments by business in Finland to enhance their biodiversity performance.

The goal of the initiative is to develop an action plan and a toolkit to increase cooperation with small and medium-sized enterprises in the field of biodiversity conservation. The aim is also to host an international meeting in Helsinki at the beginning of 2010 to launch the initiative and bring it to the attention of the media. The ultimate goal is to launch a working platform that will bring together small and medium-sized enterprises, non-governmental organisations and policy-makers in order to integrate and mainstream biodiversity into different sectors in society.

The Ministry of the Environment has allocated 20,000 euros for the preparation phase. The initiative will engage with already existing national business and biodiversity platforms, as well as with the economics of ecosystems and biodiversity (TEEB) study outcomes for developing the Business case for Biodiversity.

2.5.8 Communication, education and public awareness

The Ministry of the Environment, together with relevant ministries and organisations, has prepared a National Biodiversity Communication Programme for the years 2009–2016. This programme will be approved by the end of the year 2009. Its implementation will be promoted and supervised by the subgroup of the national monitoring group for biodiversity.

The Ministry appointed a Sub-committee for Education to the Finnish National Commission on Sustainable Development in 2004. The Sub-committee was responsible for preparing the Sustainable Development Strategy and Implementation Plan for Education and Training 2006–2014 (2006). It supports expanding the networking and collaboration at the local, regional, national and international level (http://www.edu.fi/julkaisut/engnetKekekajako.pdf).

The plan for piloting the Baltic21E programme in Finland, conceived by a Ministry of Education committee, was implemented from 2002 to 2005. The second report of the committee (2006) combined the Finnish Baltic21E action plan and the plan for implementation of sustainable development in education and research according to the national Development Plan for Education and Research with the Finnish strategy for the Decade of Education for Sustainable Development (DESD) 2005–2014. The vision for the Finnish education system was that all individuals can contribute to sustainable development which satisfies the needs of today's populations without jeopardizing the possibilities of future generations to satisfy their needs. The concept of education for sustainable development takes a holistic view of development by addressing the ecologic, economic, social and cultural dimensions of sustainable development (http://www.minedu.fi/export/sites/default/OPM/Julkaisut/2006/liitteet/tr07.pdf?lang=en).

In primary school education programmes, biodiversity aspects are included into a broader context of promoting sustainable development. According to the National Core Curriculum for Basic Education, the pupils will learn about species, their habitats and life cycles, and their adaptation to their living environments. The pupils will develop their environmental literacy, act in an environmentally beneficial way, care for their local environment, and protect nature. They will come to understand the main objectives of environmental protection and the principles of sustainable consumption of natural resources. One of the core contents is the identification of the main species of plants, fungi, and animals in the pupils' home region and the guided collection of plants (e.g. collection of digital herbarium). The final assessment criteria for grade 8 are that the pupils will know how to depict ecologically sustainable development and the importance of environmental protection and the preservation of biodiversity (http://www.oph.fi/english/page.asp?path=447,27598,37840,72101,72106).

According to the National Core Curriculum for Upper Secondary Schools 2003, students must understand the meaning of natural diversity at different levels of ecosystems. They will understand the significance of biodiversity to the future of humanity and they will understand their responsibility for the state of the environment and know how to act in accordance with the principles of sustainable development. During the course in environmental ecology, one core content area is biodiversity and its significance: 1) biodiversity as a natural resource, 2) endangerment and protection of species and habitats, and 3) reduction of biodiversity (http://www.oph.fi/english/page.asp?path=447,88611,27598,37840,72101,72105).

The development of biodiversity education in the Finnish schools has been based on the work done in the international ENSI project (Environment and School Initiatives). The ENSI project consists of a voluntary cooperative group of members from 30 OECD countries (Europe, Asia-Pacific and North-America), and the project has established a partnership with UNESCO. One of the objectives of the ENSI project has been to develop pedagogical methods which can help to strengthen the cooperation between educational

institutions (schools), local administration and researchers on a local level by making use of the new information technology. Biodiversity education has been an excellent example of this kind of development work. The first pilot NatureGate Online Service was founded in 2008. It was presented to the Finnish ENSI group and most of the members have tested and praised it. Also the International Union for Conservation of Nature (IUCN) has written a positive evaluation of it (for more information, see http://www.naturegate.net/, www.iucn.org/about/union/commissions/cec/?2614/, www.ensi.org/, http://www.edu.fi/hankkeita/ensi/esittely.htm).

Supplementary teacher training is organized to improve awareness of species and pedagogical skills related to biodiversity. Material is produced for the Internet to boost levels of knowledge about species and sustainable development education (see http://www.edu.fi/teemat/keke/).

The Finnish ENO-Environment Online is a global virtual school and network for sustainable development and environmental awareness. Environmental themes are studied within a school year on a weekly basis. Thousands of schools from 124 countries have taken part (http://www.joensuu.fi/eno/basics/briefly.htm, http://www.joensuu.fi/eno/themes/treeplanting.htm).

In the recommendations of the meeting of the European Platform for Biodiversity Research Strategy, held under the Finnish EU Presidency in Helsinki in November 2006, the importance of biodiversity education was acknowledged (for more information, see http://www.epbrs.org/PDF/EPBRS-FI2006-Education%28final%29.pdf).

Countdown 2010 Initiative on Halting the Biodiversity Loss and the NatureGate website

The Countdown 2010 Initiative started by the IUCN and the European Union aims at halting the loss of biodiversity. The initiative brings to public attention new means to reach this goal. Safeguarding natural diversity is paramount for human welfare and livelihoods.

The Countdown competition is arranged in Finland every two years. The first competition was arranged during Finland's EU Presidency in the autumn of 2006. The successful natural landscaping of a former dump and landfill site, with its ingenious and unique reuse of waste soil, its introduction of wholly domestic species and the environmental education of children and youth at the site, singled out the Crafts Workshop of the Helsinki City Public Works Department's Environmental Production branch as the clear winner of the 2006 Countdown competition.

The prize for the best action for Finnish nature in 2007 to 2008 was given to the City Council of Espoo with its decision to protect 550 hectares of forest to celebrate the 550th anniversary of the City. The best action was found in Finland's second Countdown 2010 competition seeking for new solutions to promote the vitality of nature and human welfare. The competition was arranged by the IUCN National Committee of Finland.

The IUCN National Committee of Finland consists of IUCN member organisations: the Government, Hunters' Central Organization, WWF Finland, the Finnish Society for Nature and Environment (Natur och miljö) and the Finnish Association for Nature Conservation. The Government of Finland is represented by the Ministry of the Environment together with the Ministry for Foreign Affairs, the Ministry of Agriculture and Forestry, the Finnish Environment Institute (SYKE) and Metsähallitus, Natural Heritage Services.

The current website version of **NatureGate** features many of Finland´s plants, birds, butterflies and landscapes, and it aims to become a valuable resource for both amateur and expert naturalists in Finland and abroad. NatureGate aims to become more interactive with technical help from Nokia, who together with Finnair and others are the project's corporate sponsors.

The idea is that users will submit field observations and photographs together with GPS data for observing and helping to build up a better picture of where different species occur. To see images and read the online NatureGate magazine, see www.naturegate.fi.

Additionally, the Connect2earth initiative by WWF, IUCN and Nokia was launched in early 2008 and aims to reach out to young people by making nature and biodiversity known through new means (new portal) and by raising awareness of nature. The portal has proved to be very popular with the young people because they can put their pictures, videos and opinions for viewing and rating by other users.

Chapter III – Sectoral and cross-sectoral integration or mainstreaming of biodiversity considerations

3.1 Governance structure

Finland is committed to the objectives of the Convention on Biological Diversity (CBD), which include the conservation and sustainable use of biodiversity, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. As a party to the CBD, Finland is committed to promoting the conservation and sustainable use of biodiversity in activities in all sectors of society (Article 6 of the CBD). Finland is also committed to the more effective implementation of these objectives so as to significantly reduce the rate of loss of biodiversity by 2010 at global, regional and national level.

Finland has promoted the conservation, management and sustainable use of biodiversity for more than a decade on the basis of the principles defined in the CBD. During the years 1996–1997 a National Action Plan for Biodiversity in Finland was drawn up by the National Biodiversity Committee, which brought together representatives of ministries, key business sectors, research institutes, environmental organizations and other stakeholder groups. This plan covered the period 1997–2005, and included 124 measures designed to promote the conservation, management, and sustainable use of biodiversity, to be implemented by 2005. The Action Plan was drafted according to a Government decision-in-principle of 21.12.1995, aiming to promote co-operation between different administrative sectors on the implementation of the CBD.

On 21st December 2006 the Finnish Government made a decision-in-principle on the National Strategy for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016. This new national biodiversity strategy and action plan (NBSAP) has a timeframe of ten years. Extensive co-operation will be ensured between the ministries and other organizations working for the conservation and sustainable use of biodiversity.

An implementation and monitoring body has been set up and chaired by the Ministry of the Environment to supervise and monitor the implementation of NBSAP 2006–2016. This body is also responsible for evaluations of trends in the state of biodiversity in Finland, assessments of the need for revisions to the NBSAP, and the establishment of constructive dialogues between administrative bodies (see Appendix 1B).

3.2 Key means to mainstream biodiversity issues

The *principle of sectoral responsibility* has been adopted in the conservation of biodiversity, meaning that each sector takes responsibility for reducing its harmful impacts on the natural environment. Progress towards such responsibility has been made within Finland's national administration, thanks to renewed legislation, developments related to biodiversity, and intensified co-operation between the administrative sectors concerned and other stakeholder groups. Biodiversity considerations have been favourably integrated into new and revised Finnish legislation including the Land Use and Building Act, the Penal Code and the Gene Technology Act and Decree, as well as the Nature Conservation Act, the Forest Act, the Water Act and the Wilderness Act.

Sectoral responsibility for the conservation, management and sustainable use of biodiversity as specified in the First and Second National Biodiversity Strategies and Action Plans has been duly adopted by the various branches of the administration. Stakeholder groups are also committed to maintain biodiversity. In particular, the Ministries of Agriculture and Forestry, the Environment, Transport and Communications, Defense, and Education have developed their activities and planning procedures, and provided training for personnel working within their administrative spheres on issues related to biodiversity.

Key tasks related to biodiversity are conducted under the administrative supervision of the Ministry of the Environment by the Finnish Environment Institute and Finland's 13 regional environment centres. The

biodiversity activities of Metsähallitus and the Finnish Forest Research Institute are supervised by both the Ministry of the Environment and the Ministry of Agriculture and Forestry. Tasks related to forestry are conducted under the supervision of the Ministry of Agriculture and Forestry by the regional forestry centres and the Forestry Development Centre Tapio. The Finnish Game and Fisheries Research Institute and Agrifood Research Finland (MTT), both of which work under the supervision of the Ministry of Agriculture and Forestry, today play an increasingly important role in the conservation of biodiversity. Experts from the Game and Fisheries Research Institute are responsible for research and monitoring work related to many threatened species, and the institute runs several important monitoring schemes. The Ministry of Transport and Communications supervises the work of the Finnish Institute of Marine Research, which also closely consults with the Ministry of the Environment whenever research concerns environmental issues such as chemical and biological research or the monitoring of the state of the Baltic Sea.

The Ministry of Education and Culture oversees the work of the Finnish Museum of Natural History, whose services are widely used by the Ministry of the Environment. These two ministries are jointly building up a new administrative system for the museum to strengthen its role as a national centre for biological information. Where international issues related to the conservation of biodiversity are concerned, there is close administrative collaboration particularly between the Ministries of the Environment, Foreign Affairs, Agriculture and Forestry, and Trade and Industry. A project focusing on the overall productivity of the nature conservation administration in Finland has been initiated as part of the Environment Ministry's own productivity programme, aiming to clarify the main responsibilities of each organization on the basis of their core tasks and processes.

The implementation of the new national biodiversity strategy and action plan (NBSAP) in the public administration is largely a matter of continuing to promote the ongoing favourable trends towards greater sectoral responsibility. The objectives of the conservation and sustainable use of biodiversity will be adopted as key principles in all administrative sectors. This involves the incorporation of these issues into strategic sectoral planning.

Many municipalities have already set good examples by incorporating the conservation and management of biodiversity into their own development processes. The State should encourage and support such efforts, and help to inform local residents and other municipalities about good practices. Non-governmental organizations (NGOs) and other interest groups involved in the national action plan have also significantly promoted the conservation, management and sustainable use of biodiversity.

Through international negotiations and co-operation in the context of the CBD, a set of principles and guidelines has been developed for a model known as the *ecosystem approach*, which aims to provide a comprehensive overview for the purposes of planning the conservation, management and sustainable use of natural areas and natural resources. The ecosystem approach stresses the importance of preserving in various ways the natural ecological structures and functions of habitats so as to safeguard the beneficial natural values and processes that form the basis for vital ecosystem services. Several features from the ecosystem approach are being implemented in Finland by various sectors (in single-sector-based management). Methods and tools derived from the ecosystem approach are applied for instance in the planning and use of water resources, in the regional planning of forestry in private forests, and in the management of all state-owned forests. However, there is still a need to integrate the principles of the ecosystem approach into a comprehensive and holistic management framework between different sectors (agriculture, fisheries, forestry, water resources, and regional planning related to the management and use of natural resources). During the first phase of this work, concrete examples of this kind of multi-sector-based management must be built up, including pilot projects.

The CBD requires environmental assessments (EA) to be conducted for any projects, programmes and plans likely to entail considerable harmful impacts on biodiversity, so as to avoid or minimise such impacts. In Finland environmental impacts are routinely assessed as an integral part of land use planning, and in assessments carried out in relation to Natura 2000 sites under Section 65 of the Nature Conservation Act, as well as in the EIAs conducted for plans, programmes and individual projects. The ecosystem approach can particularly be applied in EIAs at the level of plans and programmes, where alternatives and wider regions can more easily be assessed.

Public participation and dialogue is important for successful implementation of EIAs. The aim is to give the views of the public more weight in addition to those of the experts. Assessments should pay attention to the practical benefits that can be obtained from biodiversity, and examine how projects will affect the availability of such benefits to different groups.

Adopting the ecosystem approach, safeguarding ecosystem services, and conducting EIAs are all important ways to ensure that the conservation and sustainable use of biodiversity is considered in all administrative sectors. These processes can also help to clarify the responsibilities of different actors.

Administrators must also collaborate with the scientific community, local authorities, NGOs, the private sector and other stakeholders. The wide-raging and challenging nature of these tasks necessitates the application of best administrative practices and management methods suited to cross-sectoral co-operation. In this context it is important to build on experiences gained during the recent implementation of strategic developments in government circles such as project portfolios and policy programmes.

Since the year 2000 it has been possible to establish *national urban parks* to protect and maintain biodiversity together with the cultural or natural landscape values of urban environments.

The concept of National Urban Parks (NUP) as a new instrument for preserving biodiversity in urban environments

The designation of National Urban Parks became possible in Finland when the renewed Land Use and Building Act was passed in 2000, with provisions on the establishment and management of such areas.

NUPs have the following goals, according to section 68 of the Land Use and Building Act:

*"A national urban park may be established to protect and maintain the beauty of the cultural or natural landscape**,** biodiversity (added in 2009), historical characteristics or related values concerning the townscapes, social, recreational or other special values of an urban environment."*

Finnish legislation on NUPs has several notable features. Decisions on NUPs are always dependent on initiatives taken by the local authorities, and the NUPs are formed according to plans made by municipalities themselves, though the ultimate decision to establish a national urban park is made by the Ministry of the Environment. After an establishment decision is approved, a management plan is drawn up for the NUP by the local authority in close collaboration with residents and other relevant parties. Management plans must also be approval by the Ministry of the Environment.

The identification of potential NUP areas is based on four technical criteria defined by the Ministry of the Environment: 1. Breadth and content, 2. Extent and contiguousness, 3. Ecology and continuity, and 4. Urban centrality. All NUP areas must fulfil all four criteria. Decisions on the establishment of NUPs are preceded by consultative co-operation between the municipality and the Ministry, and a detailed field evaluation.

The development of NUP network forms part of both Finland’s national biodiversity strategy and the national Countdown 2010 process. The NUP network aims to complement other national networks of national parks and Natura 2000 sites. So far four national urban parks have been established, in Hangö, Hämeenlinna, Heinola, and Pori. All of these towns are located in Southern Finland, and all the NUPs contain diverse natural areas including Natura 2000 sites, sites protected at national level protected sites and areas included in various national conservation programmes. The NUP of Hangö, established in 2008, includes approximately 6,000 ha of marine and coastal environments in the southernmost part of Finland. It also combines several smaller protected areas and areas important for the preservation of threatened species, and constitutes an "ecological marine bridge" between the Achipelago Sea Biosphere Reserve and the Ekenäs Archipelago National Park. The NUP Concept seems to be a successful tool to gather protected

areas of different kinds under the same land use and management regime, and thus prevent the isolation of protected sites within larger urban environments. In some cases the natural features of Finland's NUPs can be even more diverse than those found in more conventional national parks.

3.3. Mainstreaming biodiversity into international co-operation

Supporting the implementation of international environmental agreements is also an integral part of the Finnish government's *development co-operation programme*. Ecosystem services are a major factor behind almost all of the UN's Millennium Development Goals. Biodiversity thus plays an important role in economic development as a whole, in addition to its importance as a factor in environmentally sustainable development.

A review of the development co-operation carried out by Finland's environmental sector was completed in spring 2006. The guidelines for Finland's development co-operation incorporate the sustainable use of biodiversity as a key factor behind efforts to reduce poverty. The environmental sector's development co-operation work is being improved with the help of objectives and measures related to the conservation, management and sustainable use of biodiversity.

3.3.1 EU co-operation and biodiversity

Austria and Finland, who both held the EU presidency during 2006, prepared a common programme for their consecutive presidencies, with biodiversity as a priority issue. During the Austrian presidency, Austria and Finland jointly organized a Meeting of European Nature Directors.

During the Austrian presidency, Finland supported Austria in the coordination of EU participation in the COP8 meeting in Curitiba, and worked as part of the EU Troika. Finland was also responsible for EU coordination on Biodiversity and Climate Change issues.

Also in 2006, the Commission published the Communication Halting the Loss of Biodiversity by 2010 and Beyond, and an accompanying action plan defining key policy areas and setting out priority objectives for 2007–2013. Finland ensured that the preparation of Council conclusions was included on the agenda of the Presidency. The Council supported the objectives of the communication and endorsed the strengthening of the integration of biodiversity and ecosystem services into relevant policies.

Finland as an EU member has been focusing on how best to take forward the elaboration and negotiation process of the international regime on access and benefit sharing (ABS). In this context, the EU has emphasized that such a regime could be composed of one or more legally binding or non-binding instruments where some elements form an integral part of existing international instruments, institutions and fora, while others are developed as self-standing elements within the framework of the CBD, in synergy with other relevant international institutions and fora. The negotiations of the ABS regime are due to be concluded by 2010 and the CBD's COP10.

3.3.2 The EC mid-term review and the 2010 target

The Commission has published a mid-term review of the implementation of the Communication on Halting the Loss of Biodiversity by 2010 and Beyond. Based on the findings of the review, the results of reporting under the Habitats and Birds Directives, and the 2010 evaluations, Finland will review its National Biodiversity Strategy and Action Plan for 2006–2016.

In its June 2009 Conclusions, the European Council raised the question of invasive alien species (IAS) and expressed the growing threats and impacts these species are causing to the environment, economic activities and human health. The Council also called on the Commission to develop an EU Strategy on

Invasive Alien Species by 2010. One of the objectives of the Finnish National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity is to control alien species in Finland through co-operation between officials both nationally and internationally, and one of its measures concerns the preparation of a national strategy and action plan for alien species, as required under the CBD. The preparation process of the National Strategy and the Action Plan on IAS was launched in Finland at the end of 2008, with a steering group and four separate sub-groups appointed for the preparation work. The national strategy is due to be completed by the end of 2010. In the meantime Finland will continue to observe and contribute to the preparation process of the EU strategy.

3.3.3 Green Diplomacy Network (GDN)

The Green Diplomacy Network is a tool used by the EU and coordinated by the Presidency of EU for using foreign ministries' diplomatic channels (demarches) to prepare the EU's outreach and positions for meetings including the CBD COPs. The aim is to disseminate information on the EU's positions and actively approach other parties to obtain feedback before COPs.

In June 2003, the European Council agreed to launch an initiative to promote the integration of environmental issues into external relations by creating an informal network known as the Green Diplomacy Network.

The main tasks of the GDN are:

- To promote the use of the EU's extensive diplomatic resources (diplomatic missions, development cooperation offices) in support of environmental objectives, orchestrating campaigns and demarches.
- In line with the European Council's mandate of promoting the integration of environment into external relations, the GDN examines how foreign ministries are integrating environmental concerns into their working processes across the spectrum.

The GDN consists of officials dealing with international environmental and sustainable development issues in full association with the Commission, in the EU's Ministries of Foreign Affairs and their diplomatic missions. The network focuses on environmental issues relevant to the EU's external relations, such as climate change, biodiversity, desertification and renewable energy.

As the external dimension of the EU's environmental policy is increasingly prominent in international affairs, the GDN plays an important role in increasing the coherence, consistency and effectiveness of European actions in the environmental domain.

The network held its first meeting in Athens in June 2003, producing a draft Action Plan and a work programme. The second GDN meeting in Rome in November 2003 resulted in the endorsement of "Working guidelines for the Network". EU Presidencies in 2006 and 2008 (AT and SI) actively coordinated the EU's work with other parties in this regard.

In line with the Working Guidelines, the GDN bases its work on EU positions as agreed in the Council. Responsibility for the coordination of the network resides with each EU Presidency in full association with the Commission. For more information on the Green Diplomacy Network see: http://ec.europa.eu/environment/international_issues/green_diplomacy_en.htm.

3.3.4 Biodiversity and climate change

Finland considers biodiversity and climate change and synergies between the two Rio Conventions as one of its top priorities, and has hosted several CBD ad hoc open-ended working group meetings (AHTEGs) on these topics. The most recent second AHTEG, focusing on climate change adaptation and biodiversity, was held in Helsinki in April 2009, in response to Decision IX/16 of the CBD. The purpose of the AHTEG was to provide biodiversity-relevant information to the UNFCCC in the form of scientific and technical advice on

the integration of the conservation and sustainable use of biodiversity into climate change mitigation and adaptation activities. The report and related conclusions are compiled in the CBD technical series. Ecosystem-based adaptation can implement a range of strategies for the management, conservation and restoration of ecosystems to provide services that enable people to adapt to the impacts of climate change. For more information on research concerning climate change, see Chapter 2.5.

Responses to climate change for indigenous and local communities and their impact on traditional knowledge related to biodiversity in the Arctic region

In the context of the CBD, Finland has continued to contribute to work on biodiversity and climate change. On the basis of the country's northerly location, it is natural that Finland's interests extend to the Arctic. Participation in the work of the Arctic Council has particularly brought Finland closer to the indigenous peoples of the Arctic.

The international expert meeting on responses to climate change for indigenous and local communities and their impact on traditional knowledge related to biological diversity in the Arctic region was convened by the Finnish Government in Helsinki in March 2008, and included participants from throughout the Arctic region. The report of this meeting was presented as an information document to CBD/COP9 in May 2008, with results also compiled in a brochure.

Climate change is a major threat to the future of arctic indigenous peoples. The Saami People of Lapland have over the centuries adapted to changes in their natural environment or the climate by changing the locations of their settlements, migrating, and learning new livelihoods. This adaptation is reflected in their traditional ecological knowledge. From the perspective of preserving traditional Saami livelihoods it would be essential to establish a specific climate change adaptation plan. There is already evidence that activities such as reindeer grazing will become more difficult because of increased winter snow cover and harder snow crusts. This would make it difficult for people to continue to live in their traditional homelands and follow traditional subsistence practices. These changes will affect the foundations of Saami culture materially and socially. To combat climate change, the traditional cultural knowledge of the Saami People must be combined with scientific knowledge in new research. Such research can identify new ways to adapt to climate change. This will require the training of indigenous researchers and an increase in research funding.

The eighth session of the **United Nations Forum on Forests (UNFF8)** in April 2009 addressed environmental issues related to forests, including forests and biodiversity conservation both inside and outside protected areas. In September 2008 Finland organised and hosted a Pan-European workshop "Forests in the Changing Environment", which provided a forum for discussion and the elaboration of a contribution from Europe to the UFF8. The workshop was part of the work programme of the Ministerial Conference on the Protection of Forests in Europe (MCPFE). The workshop was attended by 51 participants from 18 countries and 13 organizations from Europe and other regions.

Finland has supported the work of the **United Nations Forum on Forests (UNFF)** financially by sponsoring the participation of representatives from developing countries in UNFF sessions and country-led Initiatives. In addition, a junior professional officer funded by Finland has worked at the UNFF Secretariat since November 2008.

The state of the world's forest *genetic resources* was on the agenda of the 19th Session of the Forestry Committee of the UN FAO in March 2009, where the EU made a common statement on this issue.

The conservation of biodiversity is an essential element of European co-operation on forests, and the preparatory and monitoring work of the Ministerial Conferences on the Protection of Forests in Europe (MCPFE). Many European organizations also participate actively in this co-operation. The MCPFEs were launched in 1990 through a Finnish-French initiative.

Additionally, Finland has participated in the EU Forest Law Enforcement, Governance and Trade (FLEGT) as well as in the regional ENA FLEG initiative.

3.3.5 The science/policy interface

Finland has actively supported the UNEP's initiative to establish an *Intergovernmental Platform for Biodiversity and Ecosystem Services* **(IPBES)**. The multilateral environmental agreements (MEAs) in the biodiversity cluster rely on various science-policy interfaces. However, the current fragmented landscape of science-policy interfaces is unable to provide the required policy support for coherent and effective decision-making. From Finland's viewpoint, there is a need for an independent panel or platform that would provide different clients and knowledge users, in particular the scientific bodies of the biodiversity-related MEAs, with timely, credible and legitimate advice. Finland has emphasized that the panel/platform should not contribute to improved decision-making concerning both conservation and sustainable use, to help achieve sustainable development and poverty eradication.

The *European Platform for Biodiversity Research Strategy* (EPBRS) is a forum where natural and social scientists, policy-makers and other stakeholders identify, structure and focus the strategically important research that is essential to conserve biodiversity, to use its components in sustainable ways, to make sure that the arising benefits are shared equitably, and last but not least, to stop biodiversity loss. The EPBRS forum was launched during Finland's first EU presidency in the second half of 1999. Finland is an active member of the EPBRS, which functions in the science-policy interface at the European level. In line with the recommendation of the meeting of the EPBRS held under the Finnish EU Presidency in 2006 concerning actions for the 2010 biodiversity target in Europe, it was concluded that: "There is a need to look beyond 2010 towards a longer-term vision as a framework for policy". Participants agreed that if society wishes to halt biodiversity loss by 2010, and then reverse loss beyond 2010, an unprecedented effort will be required including research, implementation and communication actions [1] that must receive high priority and adequate financial support. For more information on the EPBRS, see http://www.epbrs.org/epbrs/static/show/documents.

3.3.6 Development co-operation

Poverty eradication and ecologically sustainable development are the most important objectives of Finland's development co-operation in line with the United Nations' Millennium Development Goals.

According to the principles of Finland's Development Policy (2007), Finland strives to ensure that all the work done in various forums to promote ecologically sustainable development, preserve biodiversity, combat climate change, prevent desertification and impoverishment of the soil, and protect the environment, should form a cohesive whole with an effective impact on all developments in both the developed and the developing world.

The principles of Finland's Development Policy point out that the developed and developing countries are parties to a number of key Multilateral Environmental Agreements (MEAs). These conventions cover, for example, climate change, protecting biodiversity, combating desertification, and international controls over chemicals. Implementing and complying with environmental conventions demands huge efforts from poor countries, not least in the context of developing their environmental administration, reporting systems and monitoring mechanisms. Supporting the developing countries' efforts to fulfil the wide-ranging objectives of the MEAs also furthers the achievement of the UN Millennium Development Goals.

Finland's new Development Policy, adopted in 2007, has a strong emphasis on ecological sustainability, and many of the consequent new Finnish projects and programmes are still under development. This work is

[1] These actions points respond to the EC Communication in on biodiversity loss (EC COM82006, 216 final) and build on the recommendations of previous EPBRS meetings. These actions are intended to achieve out-comes in the short term, medium and long term (beyond 2010).

done in close collaboration with partner countries in line with their own priorities, according to the principles of the Paris Declaration on Aid Effectiveness. Finnish embassies in developing countries are in close contact with the respective government officials, looking for ways and means to support ecologically sustainable development.

During the EU Presidency of 2006 Finland organised in collaboration with IUCN and France an international conference on Biodiversity in European Development Co-operation. On the basis of this conference, EU Council Conclusions were prepared (Doc. no 184/06 DEVGEN). The importance of biodiversity in the context of development cooperation is also highlighted in the National Strategy for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016.

Finland has supported the recommendations of the Biodiversity in European Development Co-operation Conference follow-up, and these recommendations have also been integrated into EU development co-operation. Finland has additionally provided funding of €50,000 to support the IUCN's subsequent *Poverty Reduction and Environmental Governance Initiative* 2008–2016 (PREGI).

Finland has been supporting the environmental administrations of Afghanistan, Georgia, Kyrgyzstan, Nepal, Nicaragua, South Africa (see e.g. Environment Outlook for North West Province http://soer.deat.gov.za/newsDetailPage.aspx?m=66&amid=5423) and Zambia, to help them fulfil the obligations of MEAs. Major partners have included the national environment ministries responsible for implementing MEAs. Such projects also support vital collaboration between these authorities and local NGOs and private sectors.

Finland has also supported several bilateral and regional programmes that promote synergy between MEAs. The Biodamaz project in Peru, for instance, is geared towards the sustainable use of the biodiversity in the Peruvian Amazonian, but through the Instituto de Investigaciones de la Amazonía Peruana (IIAP) its outcomes can also be used in work related to other MEAs. The Biodamaz project ran during the period 1999–2007 and its good practices are being replicated in the regional project BioCan (http://www.comunidadandina.org/biocan/) in collaboration with the Andean Community (CAN) which involves Bolivia, Columbia, Ecuador, and Peru.

At the national level co-operation between conventions has been promoted through initiatives including a joint report produced by the Ministry for Foreign Affairs and the Ministry of the Environment on international environmental conventions and Finland's development co-operation programme. In future it will be important to ensure that the implementation of environmental agreements is well integrated into both national and international sustainable development strategies.

The Ministries of Environment and Foreign Affairs publish a book on MEAs and their relevance to development policy, which is updated frequently (1st edition 2005, 2nd 2007, 3rd due in 2010). Authors include the officials responsible for the implementation of each MEA. The book briefly outlines each MEA and describes the related challenges for development policy. In a related lecture series held at Helsinki University the same officials present the respective MEAs to environmental sciences students.

3.3.7 Financial resources

Finland's contribution in 2008 to the UNEP Environmental Fund amounted to USD 4,539,370. Finland additionally contributed to special funds that aim to support various UNEP activities such as the work of climate treaty coordinators in South East Asia, the implementation of the international chemicals strategy, the disposal of toxic waste, and post-conflict work.

Finland has a special programme to support young professionals (JPO; APO) in the UN system. An increasing number of young professionals are now stationed in biodiversity related organisations and institutions. Finland will support a Junior Professional Officer at Biodiversity International who will start work during 2009. Young professionals both from Finland and partner countries are also engaged in bilateral and regional projects.

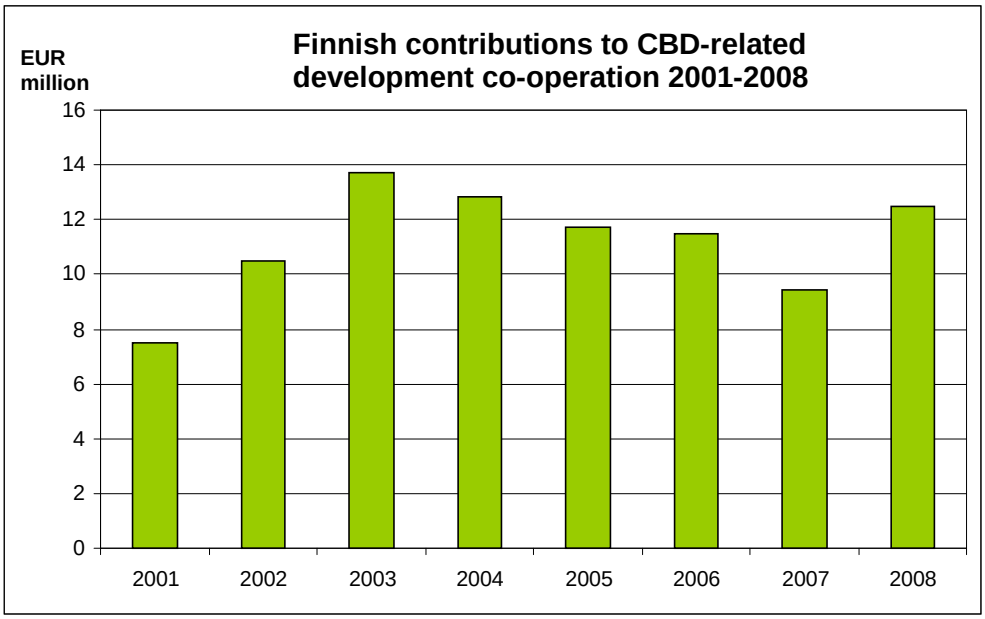


Figure 5. Finnish development co-operation funding supporting the objectives of the CBD 2001–2006.

Synergic co-operation between the CBD and multilateral environmental agreements (MEAs), and the work of the Global Environment Facility (GEF)

Finland's contributions to the biodiversity activities of the Global Environmental Facility (GEF) will amount to an estimated 2.2 million euros a year over the 4th replenishment period 2006–2010.

Finland contributes about 60,000 euros per year towards the CBD's Secretariat's efforts to enhance the participation of developing countries' representatives in MEA negotiations and MEA synergies.

Development co-operation resources can be used to promote the strengthening of an enabling environment for development in the poorest countries, in order to improve the conditions for investment and trade, and to achieve economic growth.

Finland additionally channels support for developing countries' conservation and use of their Plant Genetic Resources (PGR) through the Consultative Group on International Agricultural Research (CGIAR) system, and appoints experts to international PGR programmes and authorities. Finland also supports projects in developing countries coordinated by the Nordic Genetic Resource Centre (NordGen).

Finland supports international co-operation *to promote synergies between multilateral environmental agreements*. In association with the OECD, the Ministry of the Environment arranged a conference in Helsinki in 2005 to consider ways to encourage private investment to promote the implementation of the Rio Conventions.

The cost-efficiency of the various international agreements related to natural resources should be purposefully improved, as recommended in the conclusions of the OECD's environmental performance review in 2008.
Convention secretariats should continue to actively seek synergies between different agreements, and strive to eliminate unnecessary structures. The agendas of the three Rio conventions alone schedule some 230 days of international meetings each year. National reporting obligations for different conventions should also be rationalised to maximise the resources available for the most important tasks, namely the practical implementation of the conventions.

3.3.8 International evaluations of biodiversity in Finland

The Environmental Performance review for the period 1997-2008 (2009) examines Finland's progress since the previous OECD Environmental Performance Review in 1997, and the extent to which the country has met its domestic objectives and honoured its international commitments. The report also reviews Finland's progress in the context of the OECD Environmental Strategy for the First Decade of the 21st Century.

According to the OECD review published in 2009 the integration of biodiversity and nature conservation concerns into Finland's national legislation has been strengthened. Finland has ratified most international agreements in the field of nature and biodiversity conservation. There have been positive developments in the protection of species including migratory species and aquatic wildlife. Management plans have been established for several game species. A national strategy on invasive alien species is under preparation to prevent their spread. The challenges recognized in the report, are presented in Conclusions (Chapter 4.1).

Finland's implementation of the EU Habitats Directive and the related conservation status have been reported for the period 2001-2006 in line with the directive's article 17. The reported results have also been published on the website www.ymparisto.fi.

Trends in biodiversity in the Nordic Countries are presented in a Nordic report published in 2009 (see also Chapter 3.4.1). The aim of this project was to evaluate progress towards the 2010 target using selected indicators. The report comprises the most comprehensive documentation of land use in the Nordic Countries to date. The areas of important biotopes such as mires, grasslands and heathlands have decreased significantly over recent decades, whereas the areas of built-up land, including urban areas and transport networks, have grown considerably in all of the Nordic Countries. Each of these trends in land use is associated with a decline in biodiversity in all of the Nordic Countries since 1990. Looking into qualitative aspects of biodiversity, the results reveal that two-thirds of the quality indicators show declines and the remaining one-third show improvements or stability. Most of the indicators used in the Nordic report have been further improved in the Finnish indicator set presented at www.biodiversity.fi.

3.4 Regional co-operation

3.4.1 Finland in Nordic co-operation on biodiversity

Finland has been implementing the Nordic Environmental Action Plan for 2005–2008 together with the other Nordic Countries. Nordic co-operation on biodiversity strives to realise the international CountDown 2010 target of halting the loss of biodiversity by 2010, as well as action on other environmental themes. Various co-operation projects have been carried out on a Nordic scale financed by the Nordic Council of Ministers www.norden.org.

The project Nordic Nature – trends towards 2010 is a communications project aimed at the wider public, NGOs, interest groups and partners in the scientific community at national level, within the Nordic region and globally.

The project publishes electronic fact sheets and other information on Nordic biodiversity, describing best practices and success stories, as well as cases where mitigation measures are needed to counter negative developments. The fact sheets are published in all the Nordic languages and in English on the project's web pages. The project will also elaborate recommendations for actions to halt the decline of biodiversity.

The project is being led by the Finnish Environment Institute (SYKE). Other participating organisations include Denmark's Agency for Spatial and Environmental Planning, Norway's Directorate for Nature Management, Sweden's Naturvårdsverket, Greenland Home Rule, Greenland Representation, the Faroe Islands' Museum of Natural History, and the Environment Agency of Iceland.

Other Nordic biodiversity projects financed by the Nordic Council of Ministers

State of biodiversity in the Nordic Countries – an assessment of progress towards the target of halting biodiversity loss by 2010 has been published by the Nordic project NordBio2010.

The state of biodiversity in Finland is much the same as in the other Nordic Countries, which have all agreed to the common target of halting the decline in biodiversity by 2010.

The *North European and Baltic Network on Invasive Alien Species* (NOBANIS) has grown from a Nordic initiative to become a stable platform for discussions on invasive alien species in the Nordic region and elsewhere in Europe. The NOBANIS web-portal provides a gateway to information on alien species.

The main purpose of the project Nordic Nature Indicators of Climate Change Effects NICC is to identify measurable parameters or indicators to facilitate the monitoring of the impacts of climate change on nature. The compilation of a list of climate indicators relevant for the Nordic region facilitates the co-ordinating and optimization of biodiversity monitoring in the Nordic Countries.

The project Local Contributions to meet the 2010 target to halt the loss of biodiversity has established a network of local authorities in the Nordic Countries who intend to carry out concrete actions on a local level and exchange their experiences. Municipalities are the key authorities responsible for land use planning, and an emphasis is placed on the role of local communities in achieving the target of halting the loss of biodiversity by 2010.

Other projects dealing with the impacts of climate change on biodiversity and its sustainable use in the Nordic Countries have been carried out over the period 2005–2008. For example, in August 2007, the Nordic environmental ministers commissioned a report about opportunities to enhance co-operation and co-ordination between the biodiversity-related MEAs. This report was completed in March 2008.

3.4.2 Co-operation between Finland and Russia on nature conservation

Since 1997 Finland's Ministry of the Environment has been implementing the Finnish-Russian Development Programme on Nature Conservation in Northwest Russia.

Co-operation projects run during the years 2006–2009 have protected biodiversity and enhanced the network of protected areas around the Finnish-Russian border and deeper in NW Russia. This co-operation incorporates nature inventories and the harmonisation of biodiversity research to provide a basis for regional and federal decisions on protection that can be well-founded ecologically, economically and socially. Other broader international co-operation has also been enhanced in addition to bilateral Finnish-Russian co-operation. In 2008 the International Contact Forum on Habitat Conservation in the Barents Region (HCF) took on an official position as the Nature Protection Subgroup of the Barents Euro-Arctic Council's environmental working group. The goal of this subgroup is to promote co-operation and coordination in biodiversity conservation with the aim of maintaining biodiversity in the Barents Euro-Arctic Region. During the period 2006–2009 the subgroup has based its work on forest protection, the ecosystem approach, the development of networks of protected areas, the conservation of natural and cultural heritage, and the integration of biodiversity considerations into economic activities and planning of adaptation to climate change.

Conservation of valuable environmental areas along the Finnish-Russian border

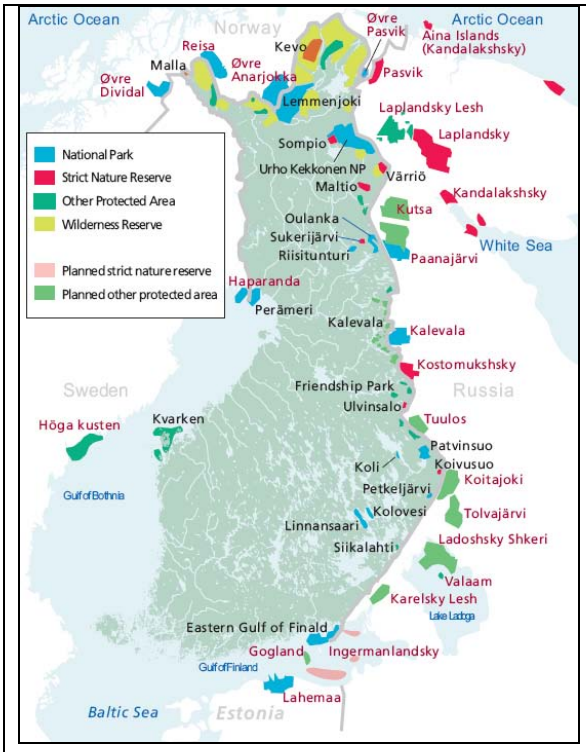
Two major projects within the Finnish-Russian Development Programme on Nature Conservation implemented since 2006 are due to be completed by the end of 2010. Both projects are being carried out in six administrative regions of Northwest Russia: in the Republic of Karelia, in the regions of Arkhangelsk, Leningrad, Murmansk and Vologda and in the City of St. Petersburg.

The first project – GAP Analysis in Northwest Russia (GAP) – has identified, analysed and assessed the representativeness of the protected areas' network, and the gaps in the network. It will produce recommendations to enhance the network based on scientifically determined conservation needs. Recommendations issued together with GIS cartographical material will form valuable tools for land use decision making in NW Russia. Finland's contributions to the joint project over the period 2006–2009 amounted to €870,000.

The second project – Development of Regional Protected Areas in Northwest Russia (RPA) – has enhanced the management of regional status protected areas by assessing management effectiveness; by organising training and workshops on legal issues, public participation, co-operation with other regions, NGOs, local and indigenous peoples; through study tours examining management practices in Finland; through the drafting of management plans for individual protected areas, and through the national and international networking of protected areas. The main partners in the project have been Metsähallitus Natural Heritage Services in Finland and the Baltic Fund for Nature in Russia. Finnish contributions to the joint project over the period 2006–2009 amounted to €260,000. For an example of transboundary co-operation between Finnish protected areas and areas in neighboring countries, see the panel on the Green Belt of Fennoscandia.

The above-mentioned projects are a logical extension of the longer-term Twin Park Co-operation that has been implemented by Metsähallitus Natural Heritage Services for four existing pairs of Finnish-Russian twinned parks. This twinning co-operation involves joint research and inventory projects, the creation of infrastructure and service facilities, improving prospects for nature tourism, measures to improve nature education and raise public awareness of nature protection, and the provision of training for the management and staff of protected areas. Finnish contributions to this twinning co-operation over the years 2006–2009 have amounted to €320,000. The establishment of a chain of functioning Finnish-Russian twinned parks extending northwards from the Gulf of Finland to the Barents Sea will connect both regional and national level current and planned protected areas on both sides of the border to form the extensive Green Belt of Fennoscandia.

Green Belt of Fennoscandia: Wide-ranging co-operation has been conducted between protected areas on both sides of the 1,250 km long border between Finland and the Russian Federation. This co-operation ultimately aims to create a chain of transboundary parks along the Finnish-Russian border from the Gulf of Finland to the River Paatsjoki in Inari. The protected areas along this *Green Belt of Fennoscandia* will make a unique contribution to nature conservation in Europe. Norway is also participating in cooperation on the Green Belt of Fennoscandia. So far four pairs of twinned transboundary parks have been set up along Finland's eastern border, and a further four pairs are projected. The achievements of active collaboration between protected areas in the green belt have so far included: 1) the internationally acclaimed collaboration between the national parks of Oulanka and Paanajärvi; 2) the establishment of the bilateral Friendship Nature Reserve, which consists of the Friendship Park in Finland and Kostomuksha Strict Nature Reserve in Russia; 3) close collaboration between Finland's Urho Kekkonen National Park and Russia's Lapland Strict Nature Reserve; and 4) trilateral collaboration between the Vätsäri Wilderness Reserve in Finland, Norway's Ovre Pasvik National Park, and Russia's Pasvik Strict Nature Reserve.



Transboundary cooperation between Finnish protected areas and areas in neighbouring countries.

Source: Metsähallitus Natural Heritage Services.

3.4.3 Arctic co-operation on biodiversity issues

Finland has supported the development of the infrastructure of the Circumpolar Biodiversity Monitoring Programme (CBMP) financially since 2006. Finnish experts have also been nominated to the CBMP's Terrestrial and Freshwater Expert Monitoring Group. These experts contribute to development of an Arctic Species Trend Index, which is one of the headline indicators for the CBMP, run by the Arctic Council's secretariat for the Conservation of Arctic Flora and Fauna (CAFF). This index will contribute to the CBD's Global Biodiversity Outlook 3 report, as well as CAFF's own Arctic Biodiversity Assessment.

Chapter IV – Conclusions:
Progress towards the 2010 target and implementation of the Strategic Plan

4.1 Progress towards the 2010 targets

Chapter IV draws upon the information presented in the first three chapters of the report. Its purpose is to analyze how national actions taken to implement the Convention are contributing to achievement of the 2010 target and the relevant goals and objectives of the CBD's Strategic Plan.

Finland's National Biodiversity Strategy and Action Plan (NBSAP) for the period 2006–2016 incorporates most of the international targets. Finnish environmental legislation has contributed significantly to the conservation of biodiversity. However, to be more effective, the separate pieces of legislation should be implemented in a more integrated manner. Several ongoing legislation revision projects concerning issues such as mining and water use are currently in progress.

Despite the many new measures that have been initiated to safeguard species and habitats, not all of the negative trends in biodiversity have been reversed. The magnitude of conservation efforts has not always matched that of natural resources extraction and other economic activities that continue to threaten biodiversity. Several of these activities have, however, been adjusted so as to take biodiversity issues better into consideration.

Terrestrial habitats

As a result of sustainable forest management practices and revised legislation since 1996 there has been a slight increase in the volume of decaying wood in forests and wooded mire habitats (in Southern Finland) over the past decade. Common forest birds seem to have adapted well to the widespread changes in the structure of their habitats and their populations are generally stable or even increasing. The decline in the share of old forest age classes has slowed, but not been reversed, while the volumes and proportions of deciduous tree species are increasing. Many key forest biotopes have been left outside of intensive forest management. Most of the country's forests have been certified according to PEFC criteria.

The volume of the growing stock in Finland´s forests has increased steadily since 1960's. Most of the growth has been due to forestry measures, particularly draining of wooded mires. Also, the annual increment of the growing stock has been clearly greater than removals for the past three decades. In principle, the surplus of trees left in the forests could provide increasing resources to species depending on dead wood.

Since the early 2000s only very few pristine mires have been drained, and this has reduced the pressure on mire habitats. However, mire birds and butterflies have continued to decline steeply, especially in the southern parts of the country where the remaining pristine mires and mire habitats are often only the isolated fragments of previously extensive mire complexes. The short-term impacts of restoration of forest and peatland habitats have been encouraging.

In agricultural habitats the EU agri-environmental support schemes have included several measures that address key biodiversity issues such as traditional rural biotopes and species-rich field margins. However, the measures applied so far have not been sufficient to stop the ongoing decline of farmland biodiversity caused by the long-term trend towards less diverse farming practices. A prolonged decline in farmland biodiversity appears to be levelling off, and weed species associated with cereal fields have partially recovered since the 1980s due to the reduced use of pesticides and the spread of organic farming.

In alpine areas in the north, lichen pastures have continued to deteriorate due to intensive grazing pressure by reindeer. Tourism has increased steeply in Lapland and poses a threat to more sensitive alpine habitat types and species due to trends including an increase in off-road traffic. On the other hand, nature tourism also creates a positive demand for unspoilt natural settings.

Too little information is available about the biodiversity of urban areas and shores to make any detailed analysis. While common urban bird species seem to have increased considerably since the late 1970s, species characteristic of habitats created by less intensive forms of urban land use have probably declined. Such habitats include harbour areas and open ruderal environments, for example.

Shore habitats are a biodiversity hotspot in terms of the number of species they host. Some 40% of Finland's coastline is affected by building developments. The end of large-scale grazing on shore meadows has resulted in the widespread overgrowth of these habitats.

Aquatic habitats

The coastal countries around the Baltic Sea have reached general consensus on the urgency of the protection of their common sea. The Baltic Sea Action Plan, which was adopted in 2007, is an ambitious programme for the conservation of the marine environment with concrete criteria and goals. The plan gives grounds for some optimism concerning the future of the Baltic Sea.

Thanks to the installation of effective wastewater treatment facilities in industrial and municipal plants, inland water habitats are today generally less affected by negative changes in water quality.

The most serious threat facing the Baltic Sea and inland waters today is eutrophication. This problem is particularly serious in the Baltic Sea along Finland's southern and southwestern coasts, as well as in small lakes and rivers in agricultural areas. The role of loads from agricultural sources has become more pronounced during recent years, and the total volumes of nitrogen entering water bodies has even increased in spite of many measures to reduce inputs. Inland water habitats have also faced many large-scale physical changes such as the construction and regulation of water bodies, the straightening of small streams and brooks, and the alteration of springs for water supply. Forestry activities have also changed the light conditions and microclimates around many small water bodies. Baltic marine habitats are additionally threatened by intensifying marine transportation, which increases the risk of oil spills, especially in the Gulf of Finland.

Red-listed species and threatened habitats

Most of the pressures and ecosystem changes mentioned above are more acute in southern parts of the country. Consequently, more species and habitats are threatened in southern than in northern Finland. Most of the well-known species associated with meadows and other traditional biotopes have declined during the 20th century. More than 90% of all traditional rural biotopes have been classified as threatened, and a great majority of these have even been classed as critically endangered. The effects of positive changes in forestry practices (such as sparing retention trees, and leaving key biotopes untouched) remain to be seen, since changes in forest biodiversity normally develop over long time-frames. Some 37% of Finland's red-listed species are dependent on forests. The first assessment of threatened habitat types in Finland indicates that many forest habitat types are threatened. A new species red-list is now under preparation for publication in 2010.

Protected areas

Finland's network of protected sea areas is generally quite extensive, and terrestrial environments are already comprehensively protected in Northern Finland. Coverage of protected areas is highest in alpine habitats, more than 85% of which lie within established protected areas. But the coverage and representativeness of protected forests and mires is quite low in Southern Finland. Only 2% of the forests in the southern half on the country are protected, while the corresponding figure for the north is 9%, and in northernmost Finland the figure is as high as 40%.

Many special mire types, such as sloping and rich fens and mire habitat successions created by land uplift, are inadequately protected. Often the wooded margins of mires have been excluded from the protected areas, and this compromises the hydrological balance of the peatland ecosystem and reduces the quality of mire-forest ecotones and mosaics. Another gap in the network of protected areas concerns marine underwater biotopes, which are presently being inventoried under a ten-year research programme. Another problem is that in marine areas the restrictions imposed by protection may sometimes be weak.

Sustainable use

Finland attributes high importance to the sustainable use of biodiversity. Issues in focus have included sustainable forest management, the need to integrate the principles of the ecosystem approach, land use planning, private sector involvement and the building of partnerships. The need to strengthen both the knowledge base concerning the sustainable use of biodiversity, and the cross-sectoral integration and implementation of biodiversity considerations into economic decisions (in industry, energy, agriculture, forestry, and transport) continuous to be a challenge, however. Finland has set up an efficient financing scheme for eco-innovations (OECD, 2009). One important emerging issue at both national and international level is the sustainable production and use of bioenergy.

Nature tourism accounts for a quarter of all tourism activity in Finland, and its share is rapidly growing. The implementation of the VILMAT programme for the development of nature tourism and the recreational use of natural areas has been prioritised. Issues related to the management of natural resources (e.g. mires, marine areas, forests and farmlands) have also been prioritised, and the drafting of a national mire and peatland strategy was initiated in 2009 as an important measure to promote the conservation and sustainable use of biodiversity. Finland has promoted sustainable use and development as part of its diplomacy, including in its relations with Russia, the other Nordic Countries and the EU (see Chapters 3.3 and 3.4).

Research and monitoring

As described above (Chapters 2.5.1 and 3.3.5), a fair amount of good quality biodiversity research has been conducted in Finland. This research has enhanced our scientific understanding of various biodiversity issues and improved the knowledge base for decision-making as regards biodiversity issues. However, there is a need to improve the utilization of this knowledge in policy- and decision-making. Solution-oriented research programmes that support decision-making should particularly be launched on issues including urban ecology, shore ecology, and biodiversity as a societal issue.

The impact of biodiversity research could be improved through a well-functioning science-policy interface. At the international level Finland has actively supported UNEP's initiative to establish an Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES). Finland is also an active member of the European Platform for Biodiversity Research Strategy (EPBRS), which functions in the science-policy interface at the European level. However, the science-policy interface also needs to be improved and enhanced at the national level within Finland.

The monitoring of biodiversity and utilization of monitoring results has taken considerable steps forward during the 2000s. Finland's national set of biodiversity indicators is already quite comprehensive, including approximately 100 of the planned 130 habitat-specific indicators (see Chapter 1.2). Further development efforts in the case of monitoring and indicators are needed for urban and shore habitats, as well as for the effects of climate change on biodiversity, in particular. Some of the existing monitoring schemes such as the National Forest Inventory could also be further developed to include more biodiversity-related parameters.

Mainstreaming biodiversity into different sectors

At national level co-operation between conventions has been promoted through initiatives including a joint report of the Ministry for Foreign Affairs and the Ministry of the Environment on international environmental conventions and Finland's development co-operation programme. It is important to ensure that in future the implementation of environmental agreements will be well integrated into both national and international sustainable development strategies.

The National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016 (NBSAP – 'Saving Nature for People') is designed to ensure that Finland meets its obligations under the Convention on Biological Diversity (CBD, Rio de Janeiro, 1992). The Finnish NBSAP is based on sectoral biodiversity programmes and reports prepared by governmental and administrative sectors. In order to monitor the implementation of the NBSAP and the CBD, the Ministry of Environment set up a *Monitoring Group for the National Action Plan for Biodiversity in Finland* to operate for a nine-year period (12.4.2007–31.12.2016).

Remaining challenges

The OECD Environmental Performance review 2009 (see Chapter 3.3.8) recognizes major challenges for biodiversity in Finland, concerning significant gaps in the protected areas network (southern forests and shores), the network's lack of ecological connectivity, the degradation of peatlands, and the eutrophication of water bodies. The review also spotlights the need to streamline the institutional framework for nature and biodiversity conservation, and the need to set quantitative national biodiversity targets.

The OECD Environmental Performance review 2009 recommends the following measures to overcome such challenges:
· set up long- and short-term, quantitative and outcome-oriented, national and regional targets to guide the implementation of the National Biodiversity Strategy and Action Plan; periodically assess achievements;
· set up a national peatland strategy to guide efforts for their conservation and management, including peatland exploitation for energy use; complete management plans for all Ramsar sites;
· enhance protection of marine areas in the Baltic Sea; finalise the ongoing inventory of marine biodiversity, develop EIA, and conduct risk assessments for shipping routes in the Baltic Sea;
· enhance the protection of rare and threatened forest habitats; link any support to private forest owners to otherwise unremunerated but beneficial public services;
· increase the financial contributions of the tourism industry towards nature conservation, for example through public private partnerships and user fees on recreation services.

Some of these challenges are presently being addressed, through for example the drafting of a national peatland strategy, and the ongoing VILMAT programme for the development of nature tourism and the recreational use of natural areas. Challenges remain for the future, however. The protection of forests in Southern Finland should be enhanced. Eutrophication remains a significant challenge in the Gulf of Finland, in the Archipelago Sea and in many southern inland waters. The financing provided to encourage private forest owners to support environmental management should be further developed. There is also a need to streamline the institutional framework for nature and biodiversity conservation.

4.2 Progress towards the goals and objectives of the CBD's strategic plan

Finland is making good progress towards the goals and objectives of the Strategic Plan of the Convention. Most goals and objectives have been addressed; work to achieve the goals of the Convention has been initiated; and some of the goals have already been achieved. Work to implement most of the national targets of the NBSAP has been started. Biodiversity concerns have in general been well integrated into Finnish legislation, policies, strategies and programmes. Indigenous and local communities are involved in implementation of the NBSAP, but not necessarily to the extent they would prefer (see Chapter 2.1 and 2.5.5).

A short account of Finnish progress made towards the global 2010 biodiversity targets is included below, for each of the goals and targets. The Finnish objectives and targets are presented earlier in the NBSAP for the period 2006–2016. The indicators used to monitor progress are presented in Chapters 1 and 2 (see also www.biodiversity.fi).

Protect the components of biodiversity

Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes

Target 1.1: At least 10% of each of the world's ecological regions effectively conserved.

Target 1.2: Areas of particular importance to biodiversity protected

Protected areas network: Approximately 12% of Finland's land area is protected and 15% is included in the EU's Natura 2000 network. Protected areas include both terrestrial and aquatic ecosystems. In addition, some special habitat types are protected by the Nature Conservation Act and the Forest Act. The majority of protected areas are situated in northern Finland, where most areas of particular importance are protected. The network of protected areas still needs further development when it comes to geographical distribution, connectivity and representativeness. This is also clearly indicated by the First Assessment of Threatened Biotopes in Finland (Raunio et al. 2008). For habitat-specific results, see Chapters 1, 2 and 4.1.

In southern part of the country, where the proportion of protected areas network is low, the conservation of ecosystems is complemented with sustainable use. Despite the fact that many steps that have been taken to safeguard species and habitats, the consequent positive developments have not been sufficient to reverse all earlier negative trends. Thus the goal will not be fully met by 2010.

Goal 2. Promote the conservation of species diversity

Target 2.1: Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups.

Target 2.2: Status of threatened species improved.

The flora and fauna and the state of the Finnish species are fairly well known. Of the approximately 45,000 species of flora, fauna and fungi that can be found in Finland, ca. 20.000 will be assessed during the fourth red list evaluation in 2010. Sufficient data is now available for about 2,000 species that could not be assessed during the third evaluation in 2000 (Rassi et al. 2001). The number of threatened species grew between the red-list assessments in 1990 and 2000, although comparisons are difficult due to changed methodology. An assessment conducted in 2005 (Hildén et al.) indicates that the overall negative trend is still continuing.

The conservation and management of threatened species are being enhanced in several ways. Several organizations are involved in species conservation, and their co-operation is promoted through the national network of special expert groups. Action plans have been prepared for around 200 of the most threatened species, but only some of them have been fully implemented. The challenge remains to provide checklists of all species groups on the internet and enhance information about recent occurrences of threatened species in a widely available database for the purposes of land use planning. Better knowledge is needed about taxonomically or ecologically poorly known species groups, and levels of species diversity outside protected areas. On the basis of previous proposals and projects, Finland still lacks a national implementation programme to prioritise the conservation and management of species and their habitats, including targets of the Global Strategy for Plant Conservation (GSPC; see Appendix IIIA). A special national monitoring group should be established to enhance and evaluate work towards national targets for species as well as targets within the GSPC.

Several species are threatened due to their poor dispersal abilities in fragmented landscapes or insufficient areas of high quality habitats. This goal is thus dependent on the achievement of Goal 1 concerning the conservation and management of habitats. There is still a need to apply sustainable use principles in unprotected areas, to increase the quality of habitats. Despite effective threat assessments and the

implementation of several measures, many of the proposed actions still need to be effectively implemented. The goal will not be fully met by 2010.

Goal 3. Promote the conservation of genetic diversity

Target 3.1: Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.

At the Finnish national level, a major improvement since 1996 was the launching of the National Plant Genetic Resources Programme in 2003. This programme covers plant genetic resources used in agriculture, horticulture and forestry. *In situ* and *on farm* conservation crops and the wild relatives of crop plants are of great national interest. The *on farm* conservation of locally adopted crops increases diversity in fields and gardens. The management of landraces and wild relatives in changing environments also provides evolutionary potential for the future. Activities to enhance the *on farm* conservation of crops have been initiated, but great challenges remain regarding the *in situ* conservation of crop plants' wild relatives. The *ex situ* conservation of plant genetic resources of seed propagated crops such as potatoes and their documentation was carried out by the Nordic Gene Bank (NGB) until 2007. From the beginning of 2008 the three sectors of genetic resources in the Nordic area were reorganized and merged. The new Nordic Genetic Resource Center now covers three areas: plants for food and agriculture; forestry; and farm animals.

Promote sustainable use

Goal 4. Promote sustainable use and consumption

Target 4.1: Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistently with the conservation of biodiversity.

Target 4.2. Unsustainable consumption of biological resources, or of products with impacts upon biodiversity, reduced.

The promotion of sustainable use is another basic principle of Finland's national biodiversity strategy, together with the conservation of habitats and species. Sustainable use has been well integrated into sectoral plans and processes, also in the private sector. Promoting sustainable forest management has been an integral part of Finnish forest policy since the 1990s. Almost all Finnish forests are PEFC certified. The Finnish FFCS forest certification system has criteria that focus on safeguarding habitat and species diversity. The concept of sustainable use is also included in the revised agri-environmental scheme. Gravel extraction is effectively regulated, and mining legislation is due for revision. Some negative trends in biodiversity show that the implementation of sustainability principles still needs to be strengthened. There is also still a need to integrate the principles of the ecosystem approach into a comprehensive and holistic management framework in different sectors (see Chapter 3.2). Wide-ranging and challenging tasks such as the application of the ecosystem approach and the use of environmental impact assessment (EIAs) are necessary from the biodiversity point of view. The goal will not be fully met by 2010.

Target 4.3: No species of wild flora or fauna endangered by international trade.

This target is already met regarding Finland's indigenous species. The import and export of threatened species is strictly regulated by the CITES Convention, to which Finland has been a party since 1976. The CITES Convention is implemented in the EU through Council Regulation No 337/98 and nationally through Finland's Nature Conservation Act (1096/1996, 44 §). For plant species, see Target 11 in Appendix IIIA.

Address threats to biodiversity

Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced.

Target 5.1. Rate of loss and degradation of natural habitats decreased.

Pressures on biodiversity are more severe in southern parts of the country, where the proportion of protected areas is quite low. Pressures affecting rare and threatened species are particularly most acute in

the south due to building and other intensive land uses including forestry and agriculture. In the south, most mire and forest areas are fragmented and traditional agricultural habitats have undergone great changes in recent decades. Shore habitats and species have been affected by building developments and increased overgrowth since the cessation of traditional grazing. Eutrophication is the main threat to water bodies, especially in the Baltic Sea along the southern and southwestern coasts and in small lakes and rives in agricultural areas. Baltic marine habitats are also threatened by increasing marine transportation. Lichen pastures in alpine areas are still deteriorating due to intensive grazing pressure by reindeer and increased tourism. The main threats to biodiversity in different habitats are presented above in Chapter 4.1, and in Chapters 1 and 2. The goal will not be fully met by 2010.

Goal 6. Control threats from invasive alien species

Target 6.1. Pathways for major potential alien invasive species controlled.

Target 6.2. Management plans in place for major alien species that threaten ecosystems, habitats or species.

The preparation process to establish a national strategy and action plan on invasive alien species (IAS) in Finland was launched in the late 2008. The strategy will aim to control threats caused by harmful invasive alien species in Finland, and to raise public awareness. As a kick off for the work, an IAS expert seminar with around 160 participants was organized in Helsinki in October 2008. The seminar attracted great interest in the media and among the public. The steering group appointed to prepare the Finnish IAS strategy includes representatives from wide range of institutions and stakeholders, including government authorities, research institutes and NGOs. Species-level work will mainly be carried out through four separate preparatory sub-groups of experts concerning the Baltic Sea, inland waters, terrestrial plants and terrestrial animals. This process is being led by the Ministry of Agriculture and Forestry, and will be finalised by the end of 2010. A fact sheet featuring certain invasive alien plant species and proposals for their management has been published on the internet as part of the Nordic Countries' NOBANIS project (see Target 10, GSPC report, Appendix III). In spite of all of the active work conducted, the goal will not be fully met by 2010.

Goal 7. Address challenges to biodiversity from climate change and pollution

Target 7.1. Maintain and enhance the resilience of the components of biodiversity to adapt to climate change.

Target 7.2. Reduce pollution and its impacts on biodiversity.

The impacts of climate change on nature in Finland cannot yet be fully estimated. Longer growing seasons and milder winters may lead to rapid increases in a number of southern species that thrive in warm climate conditions. However, northern species requiring cold conditions will suffer from such changes as the habitats suitable for them become scarcer. Some of the invading southern species may be harmful pests or diseases.

In 2005 Finland became one of the first countries in Europe to adopt a national adaptation strategy to address climate change. This strategy presents the anticipated impacts of climate change in different sectors, and sets out measures to be taken until 2080. The objective of the strategy is to improve the capacity of society to adapt to the changes ahead. Through mainstreaming, both the Government and other stakeholders will take further action to promote adaptation. The National Strategy for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016 also presents means of promoting co-operation between various administrative sectors and the responsible distribution of tasks in conserving biodiversity, while also considering aspects related to adaptation to climate change.

The adaptation strategy includes 21 recommendations for possible measures that could facilitate the adaptation of natural biota to climate change, including the monitoring and development of the protected areas network, the restoration of habitats, the conservation and management of species important for biodiversity, and the eradication of harmful alien invasive species. The goals and methods applied in protected area management may need to be revised in the future. Considerable research is still required before these measures can be successfully implemented. Significant knowledge gaps concern impact and

adaptation research, including the regional modeling of relationships between climate change and biodiversity, the assessment of protected areas for the likely effects of climate change, and the identification of species and habitats at risk of being significantly affected by climate change.

Several important research projects have been launched in recent years. These include the EU Life+ project VACCIA (Vulnerability assessment of ecosystem services for climate change impacts and adaptation), EU Alarm projects studying impacts of climate change to biodiversity of northern environments, as well as projects on the growth, health and biodiversity of boreal forest ecosystems. Also a five-year (2006-2010) research programme (Climate Change Adaptation Research Programme ISTO) was launched to support the implementation of the National Adaptation Strategy.

Finland has put much effort into meeting the target to reduce pollution and impacts on biodiversity (target 7.2). For example Finland has decreased trends of phosphorus loading from Finnish territory to the Baltic Sea, and steeply decreased concentrations of organochlorine compounds. However, toxic compounds are still stored in sediments or accumulating in trophic chains. The goal will not be fully met by 2010.

Maintain goods and services from biodiversity to support human well-being

Goal 8. Maintain the capacity of ecosystems to deliver goods and services and support livelihoods

Target 8.1. Capacity of ecosystems to deliver goods and services maintained.

Target 8.2. Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people, maintained.

The term ecosystem services is used to describe all the benefits that people obtain from nature. These services can include commodities such as food, water, and wood for fuel and construction, as well as vital natural processes such as ecosystems' capacity to prevent flooding, resist drought, restrict the spread of diseases, and resist the impoverishment of soils. Non-material ecosystem services include the psychological and spiritual benefits people gain when enjoying recreational activities in natural settings.

Target 8.1 has largely been met. The capacity of ecosystems to deliver various goods and services and support livelihoods is generally quite well maintained in Finland. Ecosystem goods and services in terms of productivity, water cycles, soil quality, and the capacity of ecosystems for carbon sequestration are generally on a sustainable basis. However, problems including the eutrophication of the Baltic Sea and various inland waters, and hydrological and ecological changes due to the large scale drainage of peatlands, still remain. There is also still a need to integrate the principles of the ecosystem approach into a comprehensive and holistic management framework between different sectors (see Chapter 2.1).

The existence of a protected area network containing varied areas with diverse nature is vital for our well-being. Finland's protected areas welcome over 4 million visitors annually, from local residents to foreign tourists. The network's extensive facilities for hiking, including wilderness huts, campfire sites and hiking trails, requires regular maintenance and servicing to meet the needs of the visitors. These facilities also channel visitors to certain trails and help to guarantee the sustainable use of the protected areas. The services of protected areas also include a network of visitor centres and other customer service points with exhibitions. The status of protected areas and their services, as experienced by visitors, are regularly monitored by means of visitor surveys. The sustainability of tourism and opportunities for local enterprises to organise activities in protected areas are ensured through cooperation contracts (see Goal 1 and Appendix IIIB).

Land use planning according to the Land Use and Building Act is an important regional tool to safeguard protected areas and their ecological connectivity (see Goal 1.2. in PoWPA report, Annex IIIB). Each of Finland's 19 regions is covered by a regional land use plan. These general plans set out medium-term and long-term objectives for regional land use strategies that guide regional development and steer decisions on issues of a trans-municipal or regional nature. They also set out a general framework for the more detailed local plans prepared by the municipalities.

The recently renewed Land Use and Building Act enables the establishment of National Urban Parks, and four have been established by the end of 2008 (see Chapter 3.2). The National Urban Park Concept seems to be a successful additional tool for collecting protected areas of different kinds under the same land use and management regime to support well-being and prevent the isolation of protected sites within urban environments. In some cases the biodiversity of these national urban parks can be even wider than in more conventional national parks.

Outdoor activities and sustainable tourism have favourably shaped the Finns' relationship with natural environment. Extensive rights of public access (known as 'Everyman's right') enable people to move freely in privately owned lands and waters. Finland is additionally implementing the VILMAT programme for the development of nature tourism and the recreational use of natural areas, which also aims to maintain goods and services derived from biodiversity.

Protect traditional knowledge, innovations and practices

Goal 9. Maintain the socio-cultural diversity of indigenous and local communities

Target 9.1. Protect traditional knowledge, innovations and practices.

Target 9.2. Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit-sharing.

The traditional knowledge of the Saami has been imbedded in the Saami language, culture and livelihoods as well as their exploitation of nature. The Saami are generally experts at reading nature and have a very special and distinct terminology for environmental conditions and phenomena. The Saami language has a vast store of terminology and appellatives for snow, reindeer, terrain, water and climate which provides confidence when navigating and moving in the landscape – including about 1,500-2,000 terms related to reindeer husbandry, about 400 words to describe the terrain, and over 300 terms for snow. As with other indigenous peoples, the Saami's traditional knowledge and its preservation are closely connected to traditional livelihoods and the use of the related language.

The future transfer of traditional knowledge may be threatened by the present social structures of northern communities and the education system, if such risks are not duly taken into consideration. Hunting and fishing are also important forms of livelihood within the Saami culture. Finland's officially established wilderness areas protect the wilderness characteristics of these parts of northernmost Finland, and also serve to safeguard Saami culture and traditional subsistence practices, while developing the potential for the diversified sustainable use of nature. To address related issues a specific Article 8(j) expert working group was established by Ministry of the Environment under the Finnish National Biodiversity Strategy and Action Plan Committee in 2009.

Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

Target 10.1. All access to genetic resources is in line with the Convention on Biological Diversity and its relevant provisions.

Target 10.2. Benefits arising from the commercial and other utilisation of genetic resources shared in a fair and equitable way with the countries providing such resources in line with the Convention on Biological Diversity and its relevant provisions.

Finland as an EU member state is actively taking part in the finalization of the access and benefit sharing (ABS) regime. The National Advisory Board for Genetic Resources set up a subcommittee in 2004 to consider the objectives and national implementation of the Bonn Guidelines. In 2006 the subcommittee completed its background report on the national implementation of the guidelines on access to genetic resources and benefit sharing. National legislation on ABS has not yet been drafted due to complications related to the current Nordic free access policy adopted by the Nordic Ministers' in 2003 and Finland's own Everyman's right policy (see Chapter 3).

Ensure provision of adequate resources

Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention

Target 11.1. New and additional financial resources are transferred to developing country parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20.

Target 11.2. Technology is transferred to developing country parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, paragraph 4.

Finland's Development Policy, renewed in 2007, emphasizes ecological sustainability, and new projects and programmes are still in the process of development. This work is being done in close collaboration with partner countries in line with their own priorities according to the principles of the Paris Declaration on Aid Effectiveness. Ecologically sustainable development and the eradication of poverty are the most important objectives. Finland has developed a clear policy for its international development co-operation that encompasses biodiversity issues (see Chapter 3.3.6). Finland's contributions towards this goal include a wide range of cooperative programmes and projects. Financial resources, technology and knowledge are routinely transferred to developing countries (see Figure 5, Chapter 3.3.6 for details of levels of support). But as Finland is currently not meeting its OECD commitment to contribute 0.7% of gross national product as development aid the goal will not be met by 2010.

Appendix I

A) Information concerning reporting party

Contracting Party	
NATIONAL FOCAL POINT	
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CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM ABOVE)	
Full name of the institution	
Name and title of contact officer	
Mailing address	
Telephone	
Fax	
E-mail	
SUBMISSION	
Signature of officer responsible for submitting national report	Marina von Weissenberg
Date of submission	24 June 2009

B) Process of preparation of the fourth national report

The National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016 (NBSAP – 'Saving Nature for People') has been designed to ensure that Finland meets its obligations under the UN Convention on Biological Diversity (CBD, Rio de Janeiro, 1992). The Finnish NBSAP is based on sectoral biodiversity programmes and reports prepared by governmental and administrative sectors. In order to monitor the implementation of the NBSAP and the CBD, the Ministry of Environment set up a *Monitoring Group for the National Action Plan for Biodiversity in Finland* for the nine-year period 12.4.2007–31.12.2016.

The data used to gain an overview of biodiversity status, trends and threats, as well as results achieved and challenges encountered in the implementation of CBD in Finland (Chapters 1 and 2), is largely based on the indicator set presented in the website www.biodiversity.fi. These indicators have been produced by the research project 'Developing a biodiversity indicator collection for Finland', which was financed by the Ministry of the Environment through the Environmental Cluster Research Programme. The project is co-ordinated by the Finnish Environment Institute (SYKE), and conducted together with governmental research institutes, other organizations and NGOs (notably the Finnish Forest Research Institute, the Finnish Museum of Natural History, the Finnish Game and Fisheries Research Institute, Metsähallitus, the South Karelia Allergy and Environment Institute, and Birdlife Finland). At present, the beta-version of the website contains 110 national biodiversity indicators. At a later stage this indicator collection is intended to provide a general platform for presenting the results of biodiversity monitoring in Finland.

This Fourth National Report on the implementation the of NBSAP and CBD in Finland has been compiled and approved by the above-mentioned National Biodiversity Monitoring Group, which is the coordinating body for preparing national biodiversity reports under the supervision of the Ministry of the Environment. The monitoring group includes representatives from all of the relevant ministries, research organizations, various economic sectors, and environmental NGOs**.** The Finnish Environment Institute (SYKE) and Metsähallitus Natural Heritage Services have provided background information, monitoring data and human resources to enable the compilation of this report. The National Biodiversity Monitoring Group has also been assisted in its work by the International Biodiversity Issues Preparation Group, which also includes representatives from different governmental sectors and stakeholders.

The preparation of this report has been the responsibility of the secretaries of the above-mentioned National Biodiversity Monitoring Group, Senior Adviser Marina von Weissenberg from the Ministry of the Environment, and Research Scientist Eija Kemppainen from the Finnish Environment Institute (SYKE). Research Scientist Ari-Pekka Auvinen has been responsible for the habitat surveys and related texts as well as the compilation of the Biodiversity.fi data. The chair of the National Biodiversity Monitoring Group, Director Timo Tanninen from the Ministry of the Environment, and Research Director Heikki Toivonen from SYKE have been largely responsible for drawing conclusions on the state of the biodiversity in Finland. Research Scientist Eija Kemppainen from SYKE has prepared the report concerning Global Strategy for Plant Conservation (GSPC, Appendix IIIA) and Park Superintendent Kari Lahti from Metsähallitus compiled the report on the Programme of Work on Protected Areas (PoWPA, Appendix IIIB). Constructive hearings have been organized as part of the preparation process. Several ministries, researchers from universities and research organizations, and NGOs have also contributed their respective comments towards the report.

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Appendix III – Progress towards targets of the Global Strategy for Plant Conservation and Programme of Work on Protected Areas

3 A) A Progress towards Targets of the Global Strategy for Plant Conservation (GSPC)

The main national challenges to save biodiversity have been listed in the National Strategy for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016. It was adopted by the government in 2006. Most of the targets of the GSPC are incorporated in the objectives and measures listed in the National Action Plan based on the above mentioned national strategy (NBSAP, Heikkinen 2007). The national measures concerning plant conservation are listed in the Action Plan under "Species protection", "Habitats and the Use of Natural Resources", "the Conservation and Sustainable Use of Genetic Diversity" or "Cross-cutting measures".

National legislation gives tools to safeguard biodiversity in Finland. Central instruments in plant conservation are The Nature Conservation Act, The Forest Act, The Land Use and Building Act, international convention on trade in threatened species (CITES) and the Common Agricultural Policy (CAP) in EU. The Nature Conservation Act (adopted in 2006) aims to achieve and maintain a favourable level of protection for habitats and wild species, and it gives tools to *in situ* conservation for the most threatened species and some habitat types. The Forest Act defines habitats of special importance to forest biodiversity. The aim of the Land Use Act is to promote ecologically sustainable development.

In Finland protected areas cover approximately 9% of the total area (marine areas included), almost all commercial forests are certified, there are European wide targets to maintain biodiversity in agricultural areas and most threatened plant species are conserved *in situ* (they have populations in protected sites).

Several organizations are responsible for conservation of plants and their habitats.
The Finnish Museum of Natural History (under the supervision of **the Ministry of Education**) is responsible of working lists of plant and fungi species (Botanical Museum, see http://www.fmnh.helsinki.fi/english/botany/index.htm).

The following organizations are under the supervision of **The Ministry of the Environment**: **The Finnish Environment Institute (SYKE)** is responsible for the national threat assessments of species together with expert groups for vascular plants, bryophytes, fungi and lichens.
The Regional Environment Centres implement conservation measures on private land.
Metsähallitus is responsible of the conservation measures (Natural Heritage Services) and natural resources on state owned land (see also the Finnish Forest Association at http://www.forest.fi).

The Ministry of Agriculture and Forestry and several organizations under its supervision are responsible for maintaining biodiversity in private forests and agricultural areas.
Saami Parliament is the highest political organ for the Saami people in Finland. Saami Parliament will prepare an own part for the national action plan for the conservation and sustainable use of biodiversity.

Several **NGOs** have their own targets to promote biodiversity issues.

GSPC Target 1: A widely accessible working list of known plant species, as a step towards a complete world flora.

The lists of know plant species in Finland are prepared and maintained by several actors:

- The Finnish vascular plants flora Retkeilykasvio (Hämet-Ahti et al.) was published by the Finnish Museum of Natural History in 1998. Revisions have been published in 2005 (Hämet-Ahti et al.). Co-operation is done with the European vascular plant check list project (Euro+Med PlantBase) and the northern Europe flora project *Flora Nordica*.
- A report about distribution, ecology and red list status of Finnish Bryophytes was published by SYKE in 2002 (Ulvinen et al.).

- A report about distribution, ecology and red list status of Finnish agarics and boletes was prepared in the Botanical Museum and published by SYKE in 2005 (Salo et al.). In a northern Europe project *Funga Nordica* new species of agarics and boletes are described, the 2nd edition was available in 2008.
- The new list of Finnish Aphyllophorales "Aphyllophoroid fungi of Finland" is published in April 2009 (Kotiranta et al., Norrlinia 19) financed by the Ministry of the Environment.
- An identification guide to European taxa of freshwater Red Algae (Rhodophyta), particularly to those in Finland, was published in 2007 (Eloranta & Kwandrans, Norrlinia 15).
- A checklist and key of the Charophytes of Finland was published in 2002 (Langangen et al., Memoranda Soc. Fauna Flora Fennica 78).
- The working list of Finnish lichens is prepared in the Finnish Museum of Natural History and it will be soon available through Internet. A lichen flora of Finland will be published in Norrlinia at the end of 2009.

The Finnish Museum of National History maintains widely available nature observation diary (Hatikka; in Finnish) and a database, which includes ca. 5 mi. floristic data from herbarium specimens, literature and archives. Atlas of the Finnish Vascular Plants (in Finnish), with annually updated versions, has been developed on the basis of this database. There is an initiative to digitalize data of Finnish herbarium collections.

Atlas Florae Europaeae (AFE) is a project for mapping the distribution of vascular plants in Europe. The project was launched already in 1965 as a collaborative effort of European botanists and since then the secretariat was established at the Botanical Museum of the Finnish Museum of Natural History, Helsinki. The Committee for Mapping the Flora of Europe and Societas Biologica Fennica Vanamo has so far published 14 volumes of the Atlas, with altogether 2759 pages and 4268 maps. The maps cover the families of the first volume of *Flora Europaea* and part of Rosaceae from the second volume, which is over 20 % of the vascular plant taxa of Europe. Taxa and texts of AFE considerably updates *Flora Europaea* and add to the general knowledge of the European flora.

The Finnish Museum of National History has approved an open access data policy, the aim of which is that a publicly available metadatabase will be maintained. In future, preparation of working lists of plant and fungi species will be the responsibility of the Museum. The Finnish Museum of National History is the GBIF node in Finland. It aims at making the world's scientific biodiversity data freely and universally available through Internet for benefits to science, society and a sustainable future. The holdings of the Botanic Garden of the FMNH were uploaded to GBIF in 2008. The Museum also maintains contacts with international and national herbaria and Botanic Gardens.

SYKE maintains threatened species database. Data is needed in conservation work and land use planning. Data sources are monitoring and inventories, done by professional and amateur botanist.

The Finnish flora is relatively well known. Knowledge about poorly known forest species in Finland has been improved in the research programme PUTTE in 2003–2007. It was a part of METSO Forest biodiversity programme for Southern Finland. In addition to internationally significant scientific publications, the PUTTE programme produces high quality identification books (Juslén et al. 2007). The programme covered for example fungi genera *Cortinarius, Ramaria*, and *Tremella* as well as epibryous and lichenicolous microfungi. A new reseach programme has been launched for the years 2009–2016.

Metsähallitus is conducting extended inventories of plants and fungi on protected areas as a part of METSO programme (2008-2016).

***Future challenges**: There is an objective to get lists of all known plant and fungi species available through internet and update them regularly. This can be promoted through negotiations about co-operation practices between the Ministry of the Environment and the Ministry of Education. To get better knowledge about the species richness inventories should be carried out also outside protected areas.*

Targets in the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016: 50, 51 and 52.

GSPC Target 2: A preliminary assessment of the conservation status of all known plant species at national, regional and international levels.

Conservation status of all plant and fungi species in Finland is assessed while assessing national threat status of species. In addition, conservation status of Habitats Directive species is assessed and reported to the European Commission every six years.

Threat assessment of species has been conducted three times in Finland: in 1985 (Rassi et al. 1986), in 1990 (Rassi et al. 1992) and in 2000 (Rassi et al. 2001). Results of the latest threat assessment, where the new IUCN criteria were applied, are available through internet. For the assessment there was enough data of ca. 8,080 plant and fungi species (50% of all known plant and fungi species in Finland). Of those, ca. 700 species (9%) were assessed threatened (IUCN categories CR, EN or VU) and over 400 others (6%) near threatened (NT).

The fourth threat assessment of species is in process. The Red Data Book is due in 2010 and it will include lists of threatened species in all species groups. Threat will be assessed also regionally in 11 sub-regions. In addition, proposals for the revision the Nature Conservation Degree (last revision in 2006) will be given: lists of threatened species and species under strict protection. Threat assessment of species will be lead by the Ministry of the Environment and SYKE and conducted in the national expert groups for vascular plants, fungi, bryophytes and lichens. Most of the work is done voluntarily, approximately 300,000 euros was provided to the plant and fungi groups in 2008–2009 by the Ministry of the Environment.

Conservation status of the Habitats Directive species concerning the years 2001-2006 was assessed and reported to the EU in 2007. Conservation status was reported separately in the boreal and in the alpine area. Results are available trough internet, see also Chapter 2.5.3. National back-ground data is stored in the Finnish Environment Institute (SYKE). For the conservation status of species listed in the Appendix V see target 11.

Monitoring of the status of the species in Finland is carried out by several actors. Some populations of threatened species have been monitored by nature conservation authorities and amateurs. Metsähallitus has monitored populations of the 16 plant species that are in their national responsibility (results will be soon available in www.metsa.fi). Monitoring methods of vascular plants have been presented earlier (e.g. Syrjänen & Ryttäri 1998, Ryttäri et al. 2003). National monitoring system of the Habitats Directive species is under preparation (summary of a Finnish report Liukko & Raunio 2008 is available in English).

Monitoring data of threatened and Habitats Directive species is stored in the national threatened species database, maintained by SYKE. General monitoring of vascular flora of Finland is done to some extent through the floristic database and annually updated versions of the Atlas of the Finnish Vascular Plants.

Targets in the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016: 47, 49, 53.

GSPC Target 3: Development of models with protocols for plant conservation and sustainable use based on research and practical experience.

In Finland, 20% of threatened plant and fungi species are forest species. New management methods and efforts to safeguard biodiversity in commercial forests have slowed down the endangerment of certain forest species since the 1990s. The main methods for maintaining biological diversity in commercial forests, described in the National Forest Programme 2015, are the protection of valuable habitats and biotopes, favouring of mixed tree stands in the management, and increasing the amount of decayed wood.

In 2002, the Government passed a decision in principle on the Forest Biodiversity Programme for Southern Finland (METSO), which complemented the National Forest Programme 2010. The Forest Biodiversity Programme METSO 2008 –2016 aims to halt the ongoing decline in the biodiversity of forest habitats and species, and establish stable favourable trends in Southern Finland's forest ecosystems. The METSO Programme is targeted to both private and state-owned lands. Funding for the programme is 180 million euros until 2012 (see also Chapter 2.2.1).

The research programme PUTTE has been a part of METSO Forest biodiversity programme in 2003–2007 and 2009–2016. It aims to improve the knowledge about deficiently known forest species in Finland (see target 2). Previous research programmes enhancing knowledge about maintaining biodiversity, were FIBRE (in 1997–2002) and MOSSE, that was supporting the METSO project (MOSSE in 2003–2006, in Finnish).

Maintenance of traditional rural biotopes as part of agri-environmental scheme (AES) is an effective way to save threatened plants, as ca. 6% of threatened plant and fungi species (28% of threatened vascular plants) grow mainly in rural habitats. For more information, see Chapter 2.2.5, Farmlands.

National Plant Genetic Resources Programme, launched in 2003, aims to save genetic resources in agriculture, horticulture and forestry. It was prepared by MTT Agrifood Research Finland. In addition to *ex situ* conservation, there are also activities to enhance on-farm conservation of crops. Still, great challenges remain to combine *ex situ* and *in situ* conservation of crop wild relatives or other wild plants. The first major project of the FinLTSER-network VACCIA (Vulnerability assessment of ecosystem services for climate change impacts and adaptation) started in the beginning of the year 2009. The aim of the *ex situ* conservation component of the VACCIA project is to outline of a strategy for development and establishment of *ex situ* conservation and integration of Finnish *ex situ* conservation efforts with European and global network (see target 8).

Nature Conservation Act gives a possibility to classify the most threatened species as species under strict protection (total of 309 plant and fungi species listed in the Nature Conservation Decree in 2006). The deterioration and destruction of an important habitat of a species under strict protection is prohibited (see target 7).

Some special projects have been started to improve knowledge of threatened species. Between The Finnish Environment Institute (SYKE) and The Forest Development Centre Tapio there is a project to change information about the known sites of forest species and prepare management recommendations for forest owners.

Many government departments have own programmes to save biodiversity, for example the environment programme of the Ministry of Transport and Communications aims at saving and maintaining the valuable secondary habitats along roads and railways (Publications / Programmes and strategies series 4/2005).

In the national water protection programme Guidelines for water protection to 2015 targets are set for the reduction of the environmental load on waters. The importance of waters is not very significant for protection of plants and fungi, since only 2% of threatened plant and fungi species occur mainly in water habitats.

The Ministry of Agriculture and Forestry has started projects to prepare a national invasive alien species strategy (see target 10) and a national mire and peatland strategy in 2009.

According to the EC LIFE Programme/Database, under the LIFE Nature Programme, there were a total of 21 projects throughout Finland with an EC contribution of over 25 million euros during the period of 2000–2007. The LIFE projects aim at managing habitats and improving knowledge about biodiversity. Stakeholder participation is an important part of the projects. Effective in plant conservation have been for example Forest Life and Saxifraga Life projects. The target species of Saxifraga LIFE were *Cypripedium calceolus* (Laitinen 2006) and *Saxifraga hirculus* (Kulmala 2005).

There is a draft for a national plant conservation action plan prepared in 2005. Most of its proposals are included in the national biodiversity action plan.

Future challenges: *See target 7.*

GSPC Target 4: At least 10% of the world's ecological regions effectively conserved.

In Finland, approximately 12% of the land cover is protected (15 % if Natura 2000 areas are included). Most of the protected areas are situated in northern Finland. In south ca. 1–2% of the area is protected. The area of protected forests (forest and low productive forest) is currently 2.1 million ha (9% of the total area of forests). In addition there are 0.8 million ha of forests under restricted forestry use. The majority of protected areas are in northern Finland. For detailes of protected areas and Natura 2000 network, see PoWPA report, Annex IIIB.

Forest Act contains definitions of habitats of special importance (key biotopes) whose natural features must be conserved. According to surveys conducted by the Forestry Centres, a total of 120,000 of such small sites have been found, they account for 77,000 hectares, or 0.5%, of forestry land in private forests. In commercial forests owned by the forest industries, such habitats account for 11,000 ha (0.7 % of the area) and in State-owned forests administered by Metsähallitus 43,000 ha (the percentage is 1.0 %). (State of Finland´s Forests 2007, Parviainen et al.).

The Nature Conservation Act lists nine protected habitat types. A preliminary survey suggests that there is a total of approximately 1,000 hectares of protected biotopes listed in the Nature Conservation Act.

Biological diversity in commercial forests is promoted by means of forest legislation, recommendations and instructions for best practices in forest management, as well as conservation agreements and forest certification. In the METSO programme in 2003–2006, a total of 121 agreements were made with private landowners on natural values covering altogether 1,216 hectares of land. On the basis of competitive tendering, about 310 ha were placed under protection for 20 years or permanently. During the years 2008–2009 previous nature conservation programmes will be completed at a cost of some 80 million euros, extending Finland's network of protected areas by some 45,000 ha. Metsähallitus's – a state enterprise responsible for managing State-owned forests in Finland – enhanced role in the METSO Programme over the next few years guarantees a kick-start to a new wave of forest conservation, while a further 10,000 hectares of State forest are to be fully protected.

Under funding from the METSO programme, Metsähallitus will restore by 2012 a total of 33,000 ha of upland forests and drained peatlands in the State conservation areas under its administration. About two-thirds of the targets set in the programme were realized by the end of 2006. An international team of experts carried out an assessment of the management of Finnish nature conservation areas in 2004. The assessment suggests that the current level of management of Finnish conservation areas is good, and apart from a few exceptions, the aims of safeguarding biodiversity have been achieved. (State of Finland´s Forests 2007).

In Finland, there is a long history of peatland drainage for agriculture and forestry. The goal for peatland restoration is the recovery of ecohydrological functions. Recovery of *Sphagnum* mosses and other peat-forming vegetation is crucial. At the end of the year 2008 there were approximately 16,000 ha of restored peatlands in protected areas, which is about 1.3% of the total area of protected peatlands. There is estimated to be about 30,000 ha of drained peatlands left in protected areas, and probably half of these will be restored (Aapala et al. 2008).

The most serious threat for the Baltic and inland waters is eutrophication. For the state of the Baltic Sea, see a separate report, sent earlier to the Secretariat of the CBD "Finland – Submission of information for the review of implementation of the Programme of work on marine and coastal biological diversity Notification 2008–095, January 29, 2009".

***Future challenges**: See Report of the Programme of Work on Protected Areas (PoWPA).*

Several targets in the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016 aim to conserve and effectively manage habitats, for example targets 1, 2, 4, 8, 26, 27, 29, 38, 41, 42, 43, 45, 46.

GSPC Target 5: Protection of 50% of the most important areas for plant diversity assured.

Protected areas and Natura 2000 areas represent rather well the areas most valuable for plant diversity, especially in northern Finland. It can be estimated, that in a whole country, a remarkable part (over 50%) of the most valuable areas of plant diversity are within protected areas. In Finland conservation network is based mainly on saving ecosystems. Species and habitats needing European wide protection (Habitats Directive species in Appendix II and habitats in Appendix I) have been taken into account while establishing Natura 2000 network. Otherwise occurrences of threatened and rare plant species or species richness have not been extensively evaluated. In the southern part of the country protected areas are usually small and scattered and there are many plant rich areas (for example herb rich forests) outside protected areas.

Assessment of threatened habitat types in Finland was conducted in 2003-2007 (Raunio et al. 2008; in Finnish). The most rare and threatened habitats and their distribution was indicated (see Chapter 2.3.3.

For information of EC LIFE projercts, see target 3.

A preliminary list of Important Fungi Areas (IFA) has been prepared by the national expert group for fungi. It consists of approximately 200 potential IFA areas.

***Future challenges**: Key areas for plant and fungi richness as well as plant and fungi species needing special protection will be identified and their protection promoted.*

GSPC Target 6: At least 30% of production lands managed consistent with the conservation of plant diversity.

Over 30% of the land cover is covered by forests. Of commercial forests (total of 18.6 million ha) state owned forests managed by Metsähallitus is approximately 19% (3.5 million ha). Almost all state-owned and private forests outside protected areas are covered by Finnish Forest Certification System (FFCS). The FFCS System conforms to the international requirements for forest certification and it can be linked to international forest certification systems. The FFCS System includes requirements for forest management and use and chain of custody verification as well as the qualification criteria for external auditing. The forest certification standards drafted in 1997 were revised in 2002–2003 based on scientific information and the experience gained from practice and they are currently under revision. A small part of forests are certified using FSC certification system.

In state owned forests natural resource planning process is used. The characteristics of an area are assessed in terms of not only economic sustainability, but also in terms of ecological and social sustainability. One of the main goals of the planning is to ensure the preservation and spread of the local flora and fauna. Metsähallitus's Geographical Information System – perhaps the most extensive in the world – forms the basis of planning at Metsähallitus. The system contains electronically saved data about soil types and forest stands and the management requirements for forest stands, as well as a tremendous amount of information on valuable habitats and landscapes.

METSO programme is targeted to improve the maintenance of habitats and structural features of forests vital to the survival of endangered species (see target 4).

In addition to the restoration work done in protected areas (see target 4 and PoWPA report in Annex IIIB), approximately 200 ha of peatlands have been restored in private land. These are mainly rich fens and

nutrient rich spruce mires that are important biotopes for many plant species. The effectiveness of restored peatlands as a buffer zone in nutrient rich retention for forestry has also been tested (Aapala et al. 2008).

Agricultural land covers approximately 7% of the total land cover, ca. 2.2 million ha. In addition to forests, traditional rural biotopes are the most valuable habitats for plant diversity. Of the nearly 19,000 hectares of valuable traditional biotopes inventoried in 1992–1998 ca. 57% were managed in traditional ways. According to a recent estimate (2009) the present total area of traditional rural biotopes in Finland is 40,000 hectares out of which some 30,000 hectares (75%) are under regular management (see also http://www.biodiversity.fi/en/indicators/farmlands/fa7-traditional-rural-biotopes). The proportion of traditional biotopes managed in state owned protected areas is little less than 10%. 93% of rural habitats were considered as threatened (Raunio et al. 2008).

***Future challenges**: Biodiversity aspects are taken into account nowadays more than previously while forests and farmlands are managed. Still there are challenges to prevent some plant and fungi groups (for example those of old growth forests) suffering from forestry and agriculture and to become more threatened. More emphasis should be paid on usability and availability of information concerning valuable habitats and species and on gathering knowledge for their biodiversity-friendly management.*

GSPC Target 7: 60 per cent of the world's threatened species conserved in situ.

In Finland 87 % of threatened vascular plant species and 75 % of threatened bryophyte species in the Mainland Finland (Åland Islands excluded) are conserved *in situ* (according to the national threatened species database, 1.1.2009). This means that they have at least one known recent population in protected areas. For fungi, lichens and algae the data is incomplete, but the corresponding number seem to be considerably lower. All vascular plants and bryophytes listed in the Habitats Directive Appendices II and IV have populations on Natura 2000 sites. According to recent data, approximately 40% of all known recent sites of threatened vascular plants are on protected sites (Kemppainen & Eeronheimo 2008).

The Nature Conservation Act gives a possibility to protect habitats of vital and important populations of species classified as species under strict protection. In the beginning of the year 2009 total of 77 sites were protected (59 for vascular plants, 9 for bryophytes, 6 for lichens and 3 for fungi).

Conservation and management plans are prepared for species classified as species under strict protection in the Nature Conservation Act and Degree. At the moment there are some 85 programmes prepared for plant and fungi species under strict protection, but some 200 are still needed. In addition, approximately 20 action plans are prepared for other rare or threatened plant species. Most of the programmes are prepared by voluntary botanists and none of them are officially approved by the Ministry of the Environment. Only some of the programmes have been implemented properly.

Several sites of the species growing on traditional rural habitats are managed regularly, for example: *Agrimonia pilosa, Armeria maritima* ssp. *maritima* and *A. maritima* ssp. *elongata, Carex vulpina, Carlina biebersteinii, Galium saxatile, Gentianella amarella*, *G. campestris* and *Pulsatilla patens*. Habitats of *Cypripedium calceolus* and *Saxifraga hirculus* were managed and restored during the EU Life-project in 2001–2004 (Kulmala 2004, Laitinen 2005). For the management of protected areas, see Appendix IIIB.

***Future challenges**: Priorities in species conservation work have been identified in a national work supervised by the Ministry of the Environment in 2007–2008. An implementation programme for the conservation of species can be drafted based on proposals of the above mentioned project and other previous projects (target in the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016: 48).*

GSPC Target 8: 60% of threatened plant species in accessible ex situ collections, preferably in the country of origin, and 10% of them included in recovery and restoration programmes.

There are 11 plant collections in the network of Finnish botanic gardens most of which hold both regionally or nationally and globally threatened plants in their collections. However, most of these collections were not originally founded for conservation purpose and it is difficult to estimate how much of the natural genetic variation is actually conserved. In the Botanical Gardens of the University of Oulu (BGUO) there is a special section for native species including ca. 20 endangered taxa. Currently it is estimated that 20% of the nationally threatened plant taxa are present in botanic garden collections. An analysis of the quantity and quality of these holdings has recently started. Ca. 20% of the taxon list of Finnish botanic garden collections has been uploaded to the PlantSearch database hosted by BGCI to contribute to the monitoring of the achievements of target 8. Finnish botanic gardens hold approximately 500 plant taxa listed on the IUCN global red list of plants.

An analysis of the quantity and quality of these holdings has recently started as a part of the VACCIA (Vulnerability assessment of ecosystem services for climate change impacts and adaptation) project. On the basis of the survey, a national plant *ex situ* conservation strategy and action plan will be compiled. By forming a steering committee of the specialists involved in plant *ex situ* conservation, the aim is to establish *ex situ* conservation in Finland as one of the conservation methods used.

The Finnish Museum of Natural History has been a member of the European seed bank initiative ENSCONET (European Native Seed Conservation Network) funded by the EU's 6th Framework Programme. One of the main goals of the initiative has been to devise a seed collecting plan for the endangered European taxa that are not yet stored in the existing seed bank collections. In the plan there are around 50 Finnish plant taxa from boreal and alpine biogeographical regions. In Finland there are no seed banks for wild species, but the resources needed for setting up one in the botanic garden of the Finnish Museum of Natural History have been surveyed.

Currently there is one research project aiming for the analysis of methods for *ex situ* conservation and subsequent recovery of endangered boreoarctic seashore species in BGUO.

***Future challenges**: There is no acute need for ex situ conservation of plant and fungi species in Finland. Preparedness, instructions and convenient methods for example species that are mostly threatened by climate change are under development. Ex situ projects will be started when needed.*

Targets in the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016: 76

GSPC Target 9: 70% of the genetic diversity of crops and other major socio-economically valuable plants conserved, and associated indigenous and local knowledge maintained.

National Plant Genetic Resources Programme was launched in 2003. The programme covers PGR both for agriculture and horticulture and for forestry. These two sectors naturally overlap in Finland and can in the future cooperatively enhance *in situ* conservation activities of crop wild relatives. In northern conditions of Finland and due to the climate change, it is essential to combine *in situ* and *ex situ* conservation of crop plants.

MTT Agrifood Research Finland is responsible for the coordination and conservation of vegetatively propagated crops. The National Advisory Board for Genetic Resources, appointed by the Ministry of Agriculture and Forestry, governs and monitors the national programme. The future challenge is to secure stable funding for the programme activities. The Second Finnish National Report to FAO "State of Plant Genetic Resources for Food and Agriculture in Finland" (Veteläinen et al. 2008) can be found on the Internet.

Forage crops and cereals together cover 80–90% of the field crop area. The number of cultivars of the most important crop plants barley, oats, wheat, *Brassica rapa*, potato and rye vary from 13 to 77. About half of the cultivars used are domestic.

In Finland landraces of crop plants represent the national cultural heritage. Following the obligations of CBD and FAO Global Plan of Action, a "landrace project" financed by the Government and implemented by the Finnish Plant Production Inspection Centre was initiated in 1997. The aim was to draw up a proposal on how varietal research, registration and on-farm maintenance of cereal, forage grass and legume landraces and old commercial cultivars could be organized in Finland. As a result of this project and a survey on the extent of cultivation of crop landraces and old cultivars in Finland, a new Decree on seed production, approval and marketing was adopted and came into force in 2000. The Decree was revised in 2007 and it now also includes pulses (pea and broad bean). The conditions for seed production require the registration of the landrace or old cultivar in question. However, only a few growers have registered landraces because the registration costs are covered by the seed grower.

Ex situ seed collections (ca. 50 taxa) and *in vitro* (potato and onions) collections are stored at the Nordic Genetic Resource Center (NordGen), formerly the Nordic Gene Bank (NGB). It is situated in Alnarp, Sweden, and it is responsible for maintaining the seed for all five Nordic Countries. 69% of the Finnish *ex situ* seed accessions accepted for long-term conservation are also stored at the Svalbard safety storage.

In *ex situ* field genebanks there are about 2,200 accessions stored at the MTT research stations around the country. The material has been grouped into ligneous ornamentals, perennial ornamentals, herbs & spices, fruits & berries and vegetables. Decisions on long-term storage responsibility have so far been taken for 406 accessions of vegetables and fruits & berries. In addition, a number of herbs, spices and medicinal plants will soon be accepted for long-term conservation. They belong to the following genera (number of accessions in parentheses): *Acorus* (11), *Arnica* (15), *Artemisia* (2), *Carum* (1), *Chenopodium* (10), *Hypericum* (40), *Hyssopus* (1), *Inula* (1), *Leonurus* (12), *Levisticum* (1), *Mentha* (32), *Myrrhis* (1), *Nicotiana* (1), *Rhodiola* (18), *Salvia* (1), *Solidago* (39), *Symphytum* (1) and *Tanacetum* (21). Less than 35% of vegetatively propagated material has a duplicate in another site, or is stored using different methods.

In 2001 the species cultivated in the test field at the University of Oulu botanical gardens included blueberry (from 18 countries, total of 47 provenances), lingonberry (10 countries, 45 provenances), crowberry (14 countries, 29 provenances), cloudberry (mainly from Finland, about 120 provenances), cranberry (17 provenances), gooseberry (from northern Ostrobothnia and Kainuu, about 50 strains). In addition, the gardens contain several provenances of rowan and bird cherry. The material has been propagated from seed or cuttings, or by micro-propagation, depending on the species.

An estimated 60% of the wild vascular flora of Finland can be classifies as crop wild relatives (CWR), of which more than one third already have some known use. Very rare or threatened are for example *Elymus farctus*, *E. alaskanus* and *E. fibrosus*. The knowledge of taxonomic diversity and the degree of rarity among Finnish crop wild relatives is quite good, but the information on the genetics of their populations is lacking (Korpelainen et al. 2007). The number of CWR in protected areas is not known.

There are four coniferous tree species native to Finland, and fewer than 30 deciduous trees and arborescent shrubs. The natural genetic resources of the main tree species in Finland – pine, spruce, silver birch and downy birch – are maintained in gene reserve forests, which have been selected to represent the variability of the species within their distribution area. The network of gene reserve forests is almost completed. To complement the *in situ* conservation, seed samples from gene reserve forest are collected for long term storing. No forests are established in Finland of clones from a single individual tree, as the reduction of genetic variability would weaken the survival of tree species. Forest tree breeding and the management of the genetic resources of forest trees are the responsibility of the Finnish Forest Research Institute (State of Finland's Forests 2007).

In the beginning of the year 2009 the Ministry of the Environment has set up a working group to implement the Article 8(j) in order to save traditional knowledge of Saami and to consider how Akwé: Kon guidelines can be applied in land use planning in the homeland of Saami people.

***Future challenges**: Maintenance of the genetic diversity of the agriculture and horticulture and forestry species is organized in Finland. The genetic diversity and protection needs of wild crop relatives and other socio-economically important wild plant and fungi species are poorly known.*

Targets in the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016: 54, 56, 89, 91.

GSPC Target 10: Management plans in place for at least 100 alien species which threaten plants, plant communities, habitats and ecosystems.

Finland is doing co-operation with other Nordic Countries in the Nordic Baltic Network on Invasive Species (NOBANIS) project. There is Finnish material on the internet about the most invasive alien plant species. The most harmful and widely distributed and completely naturalized alien plant species in Finland are: *Elodea canadensis*, *Glyceria maxima*, *Heracleum mantegazzianum*, *H. persicum, Impatiens glandulifera, Rosa rugosa* and *Lupinus polyphyllus*. Other alien species, easily running wild or , more or less locally naturalized, include *Impatiens capensis*, *Lysichiton americanus, Fallopia* species *F. japonica*, *F. sachalinensis and F. x bohemica, Solidago* species *S. canadensis, S. altissima, S. gigantea* ssp. *serotina* and *S. graminifolia, Aster salignus.* Birds distribute ornamental species like *Amelanchier spicata*, *Sambucus racemosa* and *Cotoneaster lucidus*. On the web pages there is also information about how to deal with garden waste.

The Finnish Museum of Natural History is taking part in collecting information about alien species. It also takes part in the work of the European Consortium of Botanic Gardens that has collated an early warning list of potentially invasive alien species. Metsähallitus has a goal to collect information about alien species growing in protected areas. Some alien plant species have already been eliminated from protected sites, especially on coastal meadows.

The Ministry of the Agriculture and Forestry started a project in 2008 to prepare a national invasive alien species strategy and an action plan (www-pages in Finnish). The project will produce a list of most harmful invasive alien species in Finland and describe prioritized measures before the end of the year 2010. All relevant stakeholders will take part in the work.

***Future challenges**: Implementation of the national invasive alien species strategy and action plan after 2010.*

Targets in the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016: 83, 84, 85, 86.

GSPC Target 11: No species of wild flora endangered by international trade.

Trade in threatened species is internationally regulated by the CITES Convention, to which Finland has been a party since 1976. In EU the CITES Convention is implemented through Council Regulation No 337/98. According to provisions in the Finnish Nature Conservation Act (1096/1996, 44 §) the competent CITES authorities are the Ministry for the Environment (Management Authority), the Finnish Environment Institute (Permitting Authority), the National Museum of Natural History (Scientific Authority) and the Customs (Enforcement Authority controlling imports and exports).

Of all CITES listed plant species only species of the Orchidaceae family are native to Finland. There are altogether 34 orchid species in Finland, of which none is threatened by international trade. So far there have been no applications for CITES permits to export wild Finnish orchids.

Drosera (non-CITES) species are collected and exported for use by the pharmaceutical industry. One *Drosera* species, *D. intermedia*, is assessed as near threatened (NT) because of the natural rarity of the species.

Cladonia subgenus *Cladina*, *Leucobryum glaucum*, genus *Lycopodium* and genus *Sphagnum* belong to the Appendix V of the Habitats Directive. According to the Directive, member states are due to assess effects of usage on the conservation status of the species listed in the Appendix V. In Finland lichens are collected and exported for ornamental purposes. In 2007 the conservation status of *Cladina* species was assessed as favourable in the boreal zone in Finland (where most collections are from) and unfavourable insufficient in alpine zone where the reindeer use it as fodder. The conservation status of other Appendix V species was assessed as favourable.

Targets in the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016: 83.

GSPC Target 12: 30% of plant-based products derived from sources that are sustainably managed.

Almost all state-owned and private forests outside protected areas are covered by Finnish Forest Certification System (FFCS). The FFCS System includes requirements for forest management and use and chain of custody verification as well as the qualification criteria for external auditing (see target 6). The forest certification standards drafted in 1997 were revised in 2002–2003 based on scientific information and the experience gained from practice and they are currently under revision. A small part of forests are certified using FSC certification system.

About 150,000 hectares (ca. 7%) of arable land is under organic farming, which is double the European average (see chapter 2 Farmlands and http://www.biodiversity.fi/en/indicators/farmlands/fa16-area-under-organic-farming).

The most important non-wood products which have an economic value are game, berries, mushrooms and lichen. There are 37 species of edible wild berries in Finland. The most important ones are bilberry (*Vaccinium myrtillus*), cowberry (*Vaccinium vitis-idaea*) and cloudberry (*Rubus chamaemorus*). The total annual harvest of wild berries is estimated to be 500–1,000 million kg. Only a small part of the crop is collected, most of it for private consumption. In a good year, the bilberry harvest is about 40 million kg and that of other berries 10 million kg. There are 27 wild herbs in Finland which are collected commercially. They are used for food products, herbal remedies and cosmetics.

There are about 200 species of edible mushroom in Finland, of which ca. 30 are accepted as marketable. The crop of marketable mushrooms in good years is about 1,200 million kg, of which about one fourth are fit for collecting. Only a couple of per cent of the overall annual mushroom crop is used. The harvest of edible mushrooms is a little less than 10 million kg, but in the best years it can reach almost 15 million. (State of Finland's Forests 2007). *Boletus edulis* is an important export product.

Decorative lichen has considerable economic value in the Oulu region (see target 11).

GSPC Target 13: The decline of plant resources, and associated indigenous and local knowledge, innovations and practices that support sustainable livelihoods, local food security, and health care, halted.

Information on agricultural and rural practices and traditions in Finland has been collected for example by special museums and associations. Sarka, The Finnish Museum of Agriculture will pass on traditions and customs related to agriculture and will act as a storehouse of information of the history of agriculture. Voluntary associations, like *Maatiainen ry*., aim at preserving traditional crops and decorative plants and local knowledge. Siida, home of the Saami Museum and the Northern Lapland Nature Centre, documented and produced an exhibition on Saami people and their traditional use of natural plants in 2007.

Traditional rural biotopes have been managed using traditional local methods for example in protected areas. Amount of traditional biotopes managed, see target 6.

Saami people have a sustainable use programme of their own as a part of the national action plan for the conservation and sustainable use of biodiversity in Finland. In the beginning of the year 2009 the Ministry of the Environment has set up a group to implement the Article 8(j) in order to save traditional knowledge of Saami people. One of the aims of this group is to consider how Akwé: Kon guidelines can be applied in national land use planning.

***Future challenges**: National targets concerning Saami people, for example safeguarding the Saami way of life and culture and reindeer husbandry especially in the conditions of climate change, should be implemented. The concept of Ecosystem services and importance of sustainable use of natural resources, recognized in the National Biodiversity Strategy and approved by the Government, should be enforced.*

GSPC Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.

LUMONET, the Finnish Biodiversity Clearing-House Mechanism of the Convention on Biological Diversity, is a national system for collecting and publishing information as required by the CBD. LUMONET is maintained by the Finnish Environment Institute (SYKE).

A national biodiversity communications programme is prepared in the Ministry of the Environment and it will be approved during the year 2009. Results of research programmes and threat assessments have been published and information is also available through internet www.environment.fi.

Metsähallitus has prepared reports of the results of monitoring their national responsibility species; information is coming soon available through internet. All existing 30 Visitor Centers and Nature Centers of Protected areas have information available about surrounding protected areas and their nature. In 2008 there were approximately 860,000 calls in the Centers.

The Finnish Museum of Natural History has strongly developed public education programmes in the last five years. The new exhibitions of the publically accessible Natural History Museum have incorporated habitat information and information on plants and fungi, including threatened ones. The Botanic Garden has arranged special exhibitions on endangered plants and conservation biology and website on plant *ex situ* conservation and seed banks has been created (in Finnish). The GSPC is being brought up in the near future in education programmes currently developed at the garden.

Biodiversity aspects are included in education programmes. At schools small herbaria are collected. There are education programmes in Universities. For example HENVI project in the University of Helsinki aims at improving collaboration between researchers, university teachers and students. It also aims to strengthen the link from new environmental research outcomes to current teaching.

In EU funded LIFE projects information sharing has been an important field (see target 3).

Protection of traditional rural habitats and their biodiversity is enhanced in agricultural environmental schemes. These include also education and awareness raising (Rural Development Programme for Mainland Finland 2007–2013).

Nordic Day of Wild Flowers is organized every year at the same time in all Nordic Countries. During the day, almost 100 field excursions are organized all over the country. The excursions are free for all interested in plants. The concept was presented as a poster during the 5th Planta Europa meeting in Romania in 2007.

The national expert groups for vascular plants, bryophytes, fungi and lichens organize seminars and field excursions for professional and amateur botanists. Also, national campaigns are held to gather information about threatened or rare vascular plants for conservation purposes.

The Ministry of Education has organized taxonomic courses for primary school teachers.

Targets in the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016: 18, 64, 65, 66, 67, 68, 69, 81, 86.

GSPC Target 15: The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to meet the targets of this Strategy.

The Finnish flora is rather well known, especially vascular plants, bryophytes and most lichen groups. The number of personnel working with plant conservation has doubled during the last 10 or 20 years, mainly in Metsähallitus, who is responsible for state owned areas. Most of the work has been used in inventories and improving the knowledge of plant species. Taxonomy specialists were trained in PUTTE research project (see target 1).

Co-operation has been done with several developing countries in protection of biodiversity and enhancing sustainable use of natural resources. There is an initiative to start a co-operation project with Zambia in biodiversity matters in 2009.

Further challenges*: There are not enough specialists available for all lichen and fungi groups. Further basic research is needed in most plant and fungi groups, especially about genetic background of the species. More personnel are needed for regional authorities to consult and negotiate with landowners when voluntary conservation methods are promoted, for example in METSO project.*

GSPC Target 16: Networks for plant conservation activities established or strengthened at the national, regional and international level.

International co-operation:

Co-operation in plant and vegetation conservation is done with *Planta Europa* network. Finnish Environment Institute SYKE, Metsähallitus / National Heritage Services and the Finnish Museum of National History are members of *Planta Europa* network.

Finnish Botanical Museums and Gardens have national and international co-operation with other similar institutions to share knowledge and develop for example *ex situ* methods. The Finnish botanic gardens are active within the European Botanic Gardens Consortium. The 5th EuroGard congress, arranged by the Consortium, will be held in Helsinki in June, 2009, with support from the Ministry of the Environment. Finnish botanic gardens are involved in developing a regional botanic garden network for the Baltic Sea Region; *ex situ* conservation is on the agenda. The Finnish Museum of Natural History is also a member of the European Native Seed Conservation Network ENSCONET and has played a crucial role in compiling a seed collecting plan for the plant species in need of seed bank conservation in the boreal biogeographical region.

Finland has co-operation with neighboring countries in saving biodiversity: Arctic area co-operation (Arctic Fauna and Flora, CAFF and Protection of the Arctic Marine Environment), Nordic co-operation, Finland – Estonia co-operation and Finland – Northwest Russia co-operation.

Finland is a member in European Cooperative Programme for Plant Genetic Resources (ECPGR). Finnish experts are members in several subgroups of the ECPGR. FAO (Food and Agriculture Organization of the United Nations) has a gene genetic resources programme. The latest report of Finland to FAO is available through Internet**.**

Finland is an active participant in several EUFORGEN (European Forest Genetic Resources Program) networks. EUFORGEN is a collaborative mechanism among European countries to promote conservation

and sustainable use of forest genetic resources. The Programme was established in October 1994 to implement Strasbourg Resolution S2 (Conservation of forest genetic resources) of the first Ministerial Conference on the Protection of Forests in Europe (MCPFE), held in France in 1990. The Northern co-operation concerning forest tree genetic resources is organized through NordGen.

In indigenous issues related to economic and social development, culture, the environment, education, health and human rights co-operation is done with the UN Permanent Forum on Indigenous Issues and the Arctic Council.

National co-operation:

Several national expert groups have been established to improve and share knowledge about plants species and species richness. There are national expert groups for vascular plants, bryophytes, lichens and fungi. Their main task is to carry out the national threat assessment of species. Similar expert groups are being established also for habitats. There are expert groups for habitat types presented in national Biodiversity web pages. Special networks have been developed to organize management and monitoring of certain habitats, for example in open esker areas to save declining plant and invertebrate species.

One goal of the VACCIA project (Vulnerability assessment of ecosystem services for climate change impacts and adaptation) is to establish a national network of institutions and specialists involved in plant *ex situ* conservation. The first meeting of network was held in April 2009.

The National Board for Genetic Resources, set up by the Ministry of Agriculture and Forestry, develops and monitors the national programme for plant genetic resources for agriculture and forestry. The programme is coordinated by MTT Agrifood Research Finland and for forest trees by Metla (Finnish Forest Research Institute).

National regional networks have been developed between specialists of different sectors. The aim is to develop methods to save, manage and restore valuable habitats also outside protected areas. Monitoring and awareness-raising is included in the projects. In addition, several NGOs have networks of their own and they do co-operation with national and regional authorities and botanists.

Further challenges*: There is a need to establish a national EPBRS (European Platform for Biodiversity Research Strategy) network in Finland to support the international IPBES (Science-policy interface) platform initiative. A special national monitoring group is needed to enhance and evaluate implementation of the targets of the GSPC*

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Organizations responsible for the conservation and sustainable use of plants:

The Ministry of the Environment http://www.ymparisto.fi/default.asp?node=5295&lan=en
The Ministry of Agriculture and Forestry http://www.mmm.fi/en/index/frontpage.html
Saami Parliament www.samediggi.fi
The Finnish Museum of Natural History
http://www.fmnh.helsinki.fi/english/, http://www.fmnh.helsinki.fi/english/botany/index.htm
The Finnish Environment Institute (SYKE) http://www.environment.fi/default.asp?node=5297&lan=EN
Tapio http://www.tapio.fi/about_tapio
Metla http://www.metla.fi/index-en.html
MTT Agrifood Research Finland https://portal.mtt.fi/portal/page/portal/www_en
The Regional Environment Centres http://www.environment.fi/default.asp?node=4661&lan=EN
Metsähallitus http://www.metsa.fi/sivustot/metsa/en/Sivut/Home.aspx;
http://www.luontoon.fi/default.asp?Section=4973
The Finnish Forest Association http://www.forest.fi
The network of Finnish botanic gardens http://www.botanicgardens.fi/

www.biodiversity.fi
www.lumonet.fi

Annex III / B
Progress towards Targets of the Programme of Work on Protected Areas (PoWPA)

CBD Programme of Work on Protected Areas goals and targets are fully incorporated in Finland's objectives regarding the national network of Protected Areas and its management. The emphasis is put on the targets with national importance.

The focus of National strategy and action plan for conservation and sustainable use of biodiversity in Finland 2006–2016 (NSAP/CBDF2016) is on strategic planning and measures to achieve the overall CBD goals and targets. The NSAP is structured in accordance with CBD goals and targets and thus functions as a main instrument in implementation of the Programme of Work on Protected Areas, among other CBD work programmes.

Natura 2000 network (N2000) with the national obligations is the most important measure in nature conservation within European Union. The establishment of N2000 network in Finland forms a strong backbone to support the achievement of the PoWPA goals and targets.

In addition, Metsähallitus Natural Heritage Services (NHS) as the main managing authority of the protected areas in Finland has designed the management targets and means to meet the challenges set by CBD Programme of Work on Protected Areas.

To conclude, Finland's response and implementation of CBD PoWPA is based on three strong pillars: N2000, NSAP/CBDF2016 and the national goal setting by NHS.

Annex III demonstrates the linkages between CBD PoWPA and Finland's Protected Areas system, management and its development towards achieving both global and national nature conservation goals related to protected areas.

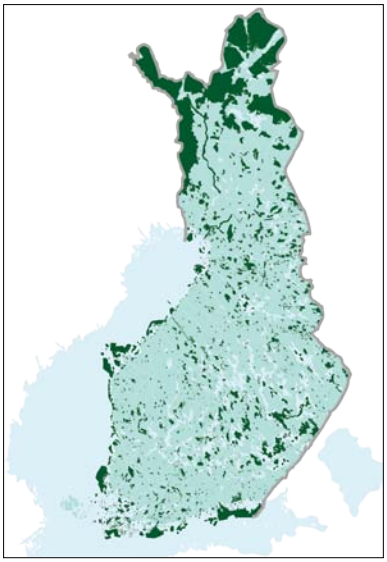
This annex is structured to address the elements, goals and targets set in PoWPA. It reflects the Finland's current status under headlines a) Description of progress, b) Incorporation of targets into relevant strategies, plans and programmes c) Obstacles, needs and future priorities and d) Information sources, when applicable.

PROGRAMME ELEMENT 1: Direct actions for planning, selecting, establishing, strengthening, and managing, protected area systems and sites

Goal 1.1: To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals.

DESCRIPTION OF PROGRESS

In General Finland has an existing comprehensive nation wide protected area system that complements the global protected area network, and supports the worldwide effort to achieve the common global conservation goals. Finland's strength is that government agency, Metsähallitus Natural Heritage Services, is almost entirely responsible of the management of the whole national system of protected areas. In this way, the quality, efficiency and effectiveness of the management of Finland's protected areas are consistent and can be conducted in adaptive manner. The system level international evaluations of the effectiveness of NHS work have given great guidance to improve the national and international level performance of NHS. An important aspect of Finland's national PA network is that the properties, land and waters under protection are owned by the state and there are no inhabitants inside the PA boundaries.



Facts and figures: Some 9–10% of Finland's total surface area is now under protection, counting legally established protected areas. When other areas reserved for nature conservation programmes are also counted, including European Natura 2000 network sites, the total area under protection increases to 15%.

Nearly all Finland's Natura 2000 sites (see Figure 1) are already statutory protected areas established by Nature Conservation Act (see Table 1.), or by Government decisions on various Nature Conservation Programmes (see Table 1.), which restrict site use until they have been established as protected areas by the proper enactments. About 15% of Natura area is protected by other legislation.

Figure 1. The Natura 2000 network in Finland. *Source: Ministry of the Environment, Finnish Environment Institute.*

Marine Protected Areas in Finland: At present, all MPAs in Finland include coastal (terrestrial) as well as marine water areas. The work on MPAs follows very closely the recent development of the European Union's Natura 2000 network in marine areas and the similar HELCOM work on Baltic Sea Protected areas.

The establishment of Natura 2000 network notably increased protection of still inadequately protected marine habitats and inland waters. Currently (1.4.2009) there is a motion by the MoEn to increase Natura 2000 network by 30 000 ha by establishing 5 new marine protected areas. The new sites cover coastal sites in the archipelago as well as valuable and threatened open sea underwater habitats in the exclusive economic zone (EEZ). In January 2009, a new four-year long EU Life+ funded project called FINMARINET begun. The FINMARINET project compiles information regarding the marine biota in the Finnish EEZ as well as in six existing marine and coastal Natura 2000 sites by applying field methods and habitat modelling.

Conservation programmes: Finland has several national conservation programmes in addition to Natura 2000 obligations. The implementation of the conservation programmes (Table 1) has been intensive since the national decision in 1996. A work programme, aiming at completing the implementation of the conservation programmes by the 2011, was announced in March 2009. The implementation has been a full responsibility of the Regional Environment Centres of Finland.

Table 1, *Source: Ministry of the Environment*

Finland's Protected Areas – 1 January 2009					
Proclaimed for Conservation	**Established**		**Reserved in Conservation Programmes**		**TOTAL AREA**
	State land and water	Private land and water	State land and water	Private land and water	**ha**
National parks	885 300	-	500	1 000	886 800
Strict nature reserves	153 600	-	-	-	153 600
Protected peatland areas	460 400	16 400	123 800	5 100	605 700
Bird breeding protected areas	-	54 500	10 600	6 900	72 000
Inland shore protected areas	-	56 400	68 200	9 300	133 900
Herb-rich forest areas	1 200	1 600	1 900	600	5 300
Old-growth forests	9 400	3 000	268 800	1 700	282 900
New Natura 2000 areas (not included in existing PA network)	-	9 800	110 000	18 400	138 200
Other protected areas in state lands (including e.g. seal PAs)	66 500	-	-	-	66 500
Other protected areas in private lands	41 800	76 300	-	-	118 100
Wilderness Areas	1 489 000	-	-	-	1 489 000
TOTAL area land and water / ha	**3 107 200** water (7,9%)	**218 000** water (54,5%)	**583 800**	**43 000**	**3 952 000**

The current status of the conservation programmes is depicted in Table 2. It demonstrates the relevant proportions of the establishment of the areas in relation to the areas reserved in total. Even though some of the programmes are falling behind the planned schedule it has to emphasized that the total area of pending areas in programmes represent only c. 15% of the total areas to be protected and that they all are already protected de facto due to the government decision.

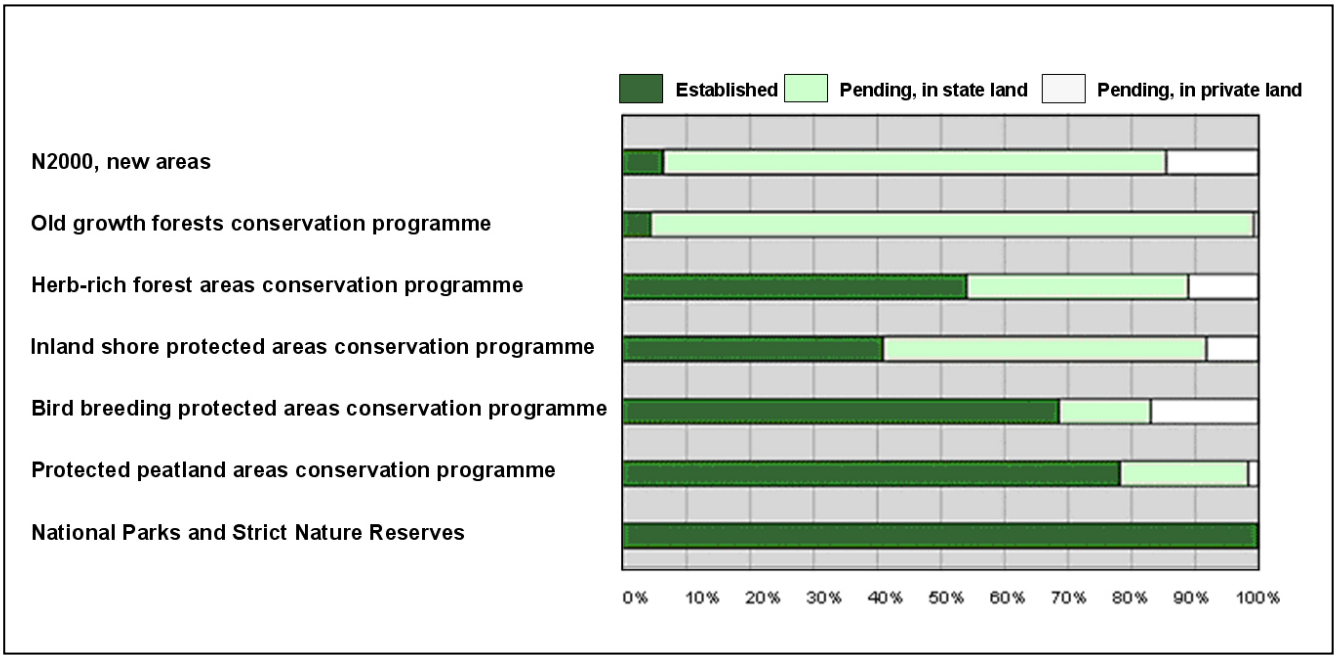


***Table 2**. Implementation of national nature conservation programmes as of January 1. 2009. Source: Ministry of the Environment.*

Indicators and trends: The main indicator in regards to the Finland's goal to create comprehensive and representative network of protected areas is the follow-up of the implementation of the conservation programmes.
The state and the development of nature in Finland is collected to one database. This database is still under development and will be finalized by 2009 and will be updated constantly. Especially the data on protected areas is still preliminary and inadequate (Indicators FO19 and MI16 on the website). Database is publicly available at www.biodiversity.fi/en/ and includes currently more than 120 indicators reflecting the development of various components of biological diversity as well as factors driving these developments.

Gap analyses: There have been two main measures in identifying the gaps within the PA network in Finland, which are described in detail below.

Assessment of threatened habitat types in Finland. The first assessment (2008) of threatened habitat types in Finland functions as a major tool to estimate the representativeness and to identify gaps of Finland's PA network. The assessment considered all natural habitat types, which were divided into seven main groups: the Baltic Sea and its coast, inland waters and shores, mires, forests, rocky habitats, traditional rural biotopes, and the fell area.

The SAVA Project, coordinated by the Finnish Environment Institute in 1997-2002, assessed the ecological representativeness of Finland's network of protected areas 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 a subsequent working group. The state of natural environment for each broad habitat type was evaluated as part of the first National Action Plan for Biodiversity in Finland (1997–2005), also assessing how comprehensively and representatively the network of protected areas conserves the remaining biodiversity of Finland's ecosystems.

INCORPORATION OF TARGETS INTO RELEVANT STRATEGIES, PLANS AND PROGRAMMES

National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016: In the strategy and action plan, all major challenges in relation to the system of protected areas in Finland have been covered. One major strategic objective is to improve the conservation and

management of biodiversity by focusing on the quality (performance, effectiveness, efficiency and representativeness) of Finland's system of protected areas and the protection of species.

Other programmes and projects: Schemes to improve and support the existing protected area system.

- METSO, The Forest Biodiversity Action Programme for Southern Finland 2008-2016: www.mmm.fi/en/index/frontpage/forests/metso.html
- HELCOM, Baltic Sea Action Plan: www.helcom.fi

The marine environment has been well acknowledged by the Finnish government in the (Finnish) Action plan for the protection of the Baltic Sea agreed in April 2002. The Finnish government received WWF's Panda Price for this accomplishment. One of the actions in this plan is the "VELMU" (www.ymparisto.fi/velmu) inventory programme that will later provide information on the distribution of marine macroscopic sessile organisms. Finland has also been an active Contracting Party of HELCOM and intends to follow up the goals and targets set up in the HELCOM Baltic Sea Action Plan.

OBSTACLES, NEEDS AND FUTURE PRIORITIES

Challenges. Key elements of the future development of Finland's system of protected areas must include the completion and strengthening of the network of protected areas, and the protection of biotopes that have not yet been adequately safeguarded. Protective measures planned for areas already acquired for the State for the purposes of conservation are still incomplete in many of these areas. Habitat change is a serious threat to nature in Finland. According to an evaluation of the previous national biodiversity action plan, the most dramatic recent changes in natural environments in Finland occur along shores and in forests. Without further actions, the species dependent on these habitats will decline, and highly demanding or specialised species will continue to become more threatened. Contrastingly, species that can benefit from or suitably adapt to anthropogenic changes will become more common. In addition, the fragmentation of habitats is a considerable threat to Finland's biodiversity. This applies especially in densely populated southern Finland where the number of landowners is enormous and the areas are small. This development is not only threatening individual valuable habitats but also weakening the potential connectivity between the areas thus making the adaptation to climate change impacts more difficult. More resources will be needed as the numbers of new protected areas are increased, and as related conservation, measures are implemented, either in the shape of new funding or redirected resources. Figure 2 clearly illustrate how the level of protection for forests is much higher in northern Finland. 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.

Future challenges regarding marine issues and especially Baltic Sea will include research on the immediate and secondary effects of climate change. The coasts of Finland freeze on average for 90-180 days in winter and the entire biota will be affected if the ice disappear or loose its current role due to global warming. However, the most immediate challenges rise from the pressures listed by the CBD and in the EU's Marine Strategy Framework Directive concerning the marine environment. Many of these pressures are poorly known (globally, as well as in Finland) and more research on these effects is needed. In addition, the EU's new Maritime Policy has lifted Marine Spatial Planning as a key tool in meeting the challenges with increased sea use and increased pressures on the marine biota.

Notable numbers of protected areas are to be established by law. Considerable work will be undertaken to establish already gazetted protected areas over the next few years. Metsähallitus NHS administers about 1600 nature conservation programme sites that have yet to be officially established. These areas, however, are protected de facto due to the government decision. In March 2009, a work plan on the establishment of the protected areas was made available. According to the work plan c. 1000 new protected areas need to be established and the rest conservation programme areas will be incorporated to the existing PAs. One

important objective of the NHS over the next few years will indeed be to assist the Ministry of the Environment in drafting statutes for protected areas.

Finland also needs to tackle the common threats to biodiversity that include e.g. hunting, poaching, reindeer grazing, visitor disturbance, climate change and potential mining. Some of these need policy level approach and some are clearly PA management related issues.

INFORMATION SOURCES

State of the Parks in Finland report (SOP):
www.metsa.fi/sop
Management Effectiveness Evaluation (MEE):
www.metsa.fi/mee
Saving nature for people - National strategy and action plan for conservation and sustainable use of biodiversity in Finland 2006–2016, 168 p. Ministry of the Environment:
www.ymparisto.fi/default.asp?contentid=258249&lan=EN
Finland's Protected Areas – 1 January 2009
http://www.ymparisto.fi/default.asp?node=1748&lan=fi
Work programme (2009-2011) on the establishment of the protected areas included to conservation programmes (in Finnish only):
www.ymparisto.fi/default.asp?node=744&lan=fi
www.ymparisto.fi/download.asp?contentid=99665&lan=fi
Database on indicators demonstrating the state and the development of nature in Finland
http://www.biodiversity.fi/en/
SAVA project publications on state of the protection of forests, mires and inland waters (in Finnish only):

Forests	http://www.environment.fi/default.asp?contentid=84095&lan=FI
Inland waters	http://www.environment.fi/download.asp?contentid=25264&lan=FI
Mires	http://www.environment.fi/default.asp?contentid=70923&lan=FI

Goal 1.2: To integrate protected areas into broader land- and seascapes and sectors so as to maintain ecological structure and function.

DESCRIPTION OF PROGRESS

Generally integration of protected areas into broader physical land- and seascapes is a difficult task itself and by adding a goal to integrate them also in to wider policies and sectoral strategies, the challenge becomes very demanding to overcome by any country. Finland's advantage in integration process is that it is scarcely populated country with ample of natural and semi-natural nature outside the PA network. In addition, the principles of overall land use policies include always the elements of sustainability and the consideration of conservation of biodiversity is often mainstreamed in policies, strategies and action plans of natural resource sectors. However, there are major challenges to deepen the integration process. Some notable progress in this field has been achieved by number of measures listed below.

Practical and successful measures in integration process of Finland's PAs:

The new METSO Programme aims to halt the ongoing decline in the biodiversity of forest habitats and species, and establish favourable trends in Southern Finland's forest ecosystems by 2016. Programme is in line with internationally defined biodiversity targets by e.g.: improving Finland's network of PAs; enhancing application of improved management methods in commercial forests to contribute to the overall conservation goals; in collaboration between forest and environmental organizations advising forest owners and training of professionals. The METSO Programme is a high profile government decision providing funding: 62 million €, for budget period 2003-2007 (pilot phase) and 182 million € for the budget period 2009 –2012.

Natural values trading: As one efficient tool within METSO programme in integrating the requirements of protected areas into sectoral interests is natural values trading. This approach is focusing on cooperation between the PA management authority, regional environmental centres and forestry centres. The rationale behind is to

draw attention of private forest owners in southern Finland in order to find new volunteer-based ways to protect biodiversity in valuable habitats that are under threat to loose the values due to commercial forestry practices.

- Cooperation between regional environmental centres and forestry centres; annually a joint invitation to tender natural values based on ecological selection criteria; tailor made for each region; intensified marketing for specific conservation needs
- Protection measures initiated by land owners
- Receiving tenders including baseline information on the site
- Good and comprehensive information for authorities facilitates procedure
- On-the-spot visits; application of ecological criteria; assessment and calculation for sale price or compensation to be paid
- Land owners have opportunity to present their views on compensation or price to be paid
- If agreement, preparation of transaction and/or concluding the contract for establishment of private protected area or a contract for a specific time period

Under the Land Use and Building Act, the local and regional land use practices are coordinated by established process of town and country planning. This is imperative in regards to securing the favourable conservation status including adequate connectivity. At the same time, the process assures the conservation of biotic and abiotic biodiversity of vulnerable areas by the plan notations and planning regulations. In addition, the planning process has to take in to the consideration the ecologically important and coherent natural areas as well as those most suitable for recreation purposes to avoid fragmentation. The regional plans in particular cover the whole surface area of Finland. In line with goals of Land Use and Building Act, three national urban parks have been established. All three contain nationally and regionally valuable natural areas and Natura 2000 sites. Such urban parks strengthen the national protected areas network, and also provide significant ecological corridors leading from inside urban areas to more natural areas in their surroundings. Plans for the designation of further national urban parks are already in the pipeline.

Ministry of Environment is actively purchasing forest areas and converting them to private protected areas to support the national network of PAs of different categories.

Ministry of Agriculture and Forestry is actively establishing measures to support ecologically sound management of the commercial forest to increase the quality of ecological networks. In addition they are improving measures to safeguard the high altitude forested habitats.

The example of the ecosystem approach applied is the new Baltic Sea Action Plan (BSAP) by the Baltic Sea Environmental Protection Commission (the Helsinki Commission, HELCOM) agreed in November 2007. In the HELCOM BSAP the HELCOM contracting parties, i.e. the countries around Baltic Sea (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden) along with the European Commission join forces in order to improve the environmental status of the Baltic Sea. The BSAP has several goals concerning eutrophication, hazardous substances, maritime activities, biodiversity and nature conservation. It also includes actions for developing assessment tools and methodologies but also actions for awareness raising and capacity building. The Ministerial Meeting in Krakow (Poland, 2007) also agreed on several recommendations concerning pollution from land-based sources, municipal wastewater sources.

In 2005-2007 Finland participated in a large Baltic Sea project funded by the European Union's Structural Fund programme Interreg IIIb, called BALANCE. BALANCE (Baltic Sea Management – Nature Conservation and Sustainable Development of the Ecosystem through Spatial Planning. The main goals of this project were: 1) the collation of marine data, 2) Baltic Seafloor mapping, 3) Biodiversity assessment and 4) Marine Spatial Planning. The project managed to compile large datasets and created datasets of its own. These have, as far as copyright and immaterial rights allow, been stored at HELCOM. The project also created marine landscape maps for the entire Baltic Sea and assessed the network of MPAs in the Baltic Sea using the widely used software MARXAN for this purpose. Furthermore, a new framework for maritime spatial planning applying zoning similar to that used in Australia at the Great Barrier Reef (the term maritime spatial planning is a synonym to marine spatial planning but favoured in Europe since the publication of the Maritime Strategy and the Roadmap to Maritime Spatial Planning).

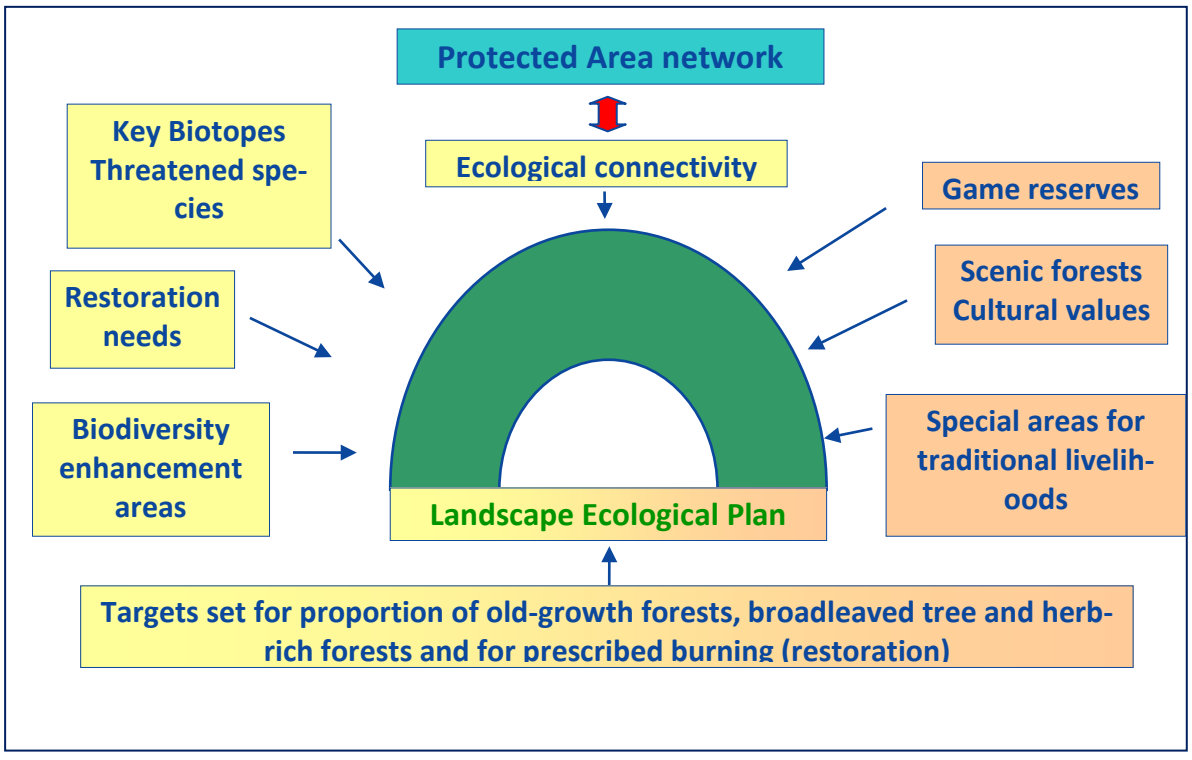
Managed forests complementing the protected area network by <u>Ecosystem-based Natural Resources Planning:</u> Metsähallitus as a state enterprise also governs the commercial forestry in state-owned land. One key objective of Metsähallitus land use planning is to conserve biodiversity by supporting the protected area network. Natural and other ecologically important 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.
The combination of nature conservation management and commercial forestry in two economically separate units under two ministries but led by one head structure and using many joint facilities has been generally beneficial for biodiversity conservation. The dual head has enabled "Ecosystem-based Natural Resources Planning" creating "Landscape Ecological Plans". This applies only in state owned land and thus the importance of this measure is higher in northern parts of the country where the state is by far the biggest landowner. This planning system takes in to account all small and moderate scale habitats important from biodiversity perspective by creating ecological corridors, protecting valuable habitats and habitats important for threatened species. Data is collected in Table 3 and the process described in Scheme 1.

In production forests managed by Metsähallitus, about 5 % of the area is fully or partly restricted from cutting due to biodiversity conservation e.g. as part of the ecological network; about 9 % has restrictions due to recreational needs or landscape protection; also the expectations of reindeer herders and needs of the Saami people favours the sensitive landscape approach. It is estimated that these restrictions reduce the annual profit by about 30 million Euros. (see Table 3).

Table 3. *Landscape ecological plans outside of the Finland's protected area network.*

Landscape ecological planning in Finnish state-owned land		
	Size (ha)	**On productive forest land (%)**
Valuable habitats	168 000	60
Ecological connections	181 000	50
Areas left permanently outside forestry on productive forest land	**215 100**	
Areas with limited forestry activities on productive forest land; Scenic forests; Cultural areas; Game areas	**379 200**	



Scheme1. *Process of landscape ecological planning in Metsähallitus.*

Management planning process. Fully participatory practice is in place within Metsähallitus Management Planning process. It is well structured, guided and documented process involving all relevant stakeholders varying from bilateral and multilateral negotiations to public events open for discussions.
The new guidelines (2009) on NHS Management planning support wider-scale planning approach. They advise that various types of protected areas can be purposefully clustered together under single management plans, including privately-owned areas where they form part of wider Natura 2000 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. The new guidelines also include the ecosystem approach as integral part of the management planning process of PAs when appropriate. 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. The new guidelines also include directions regarding management planning of private PAs.

INCORPORATION OF TARGETS INTO RELEVANT STRATEGIES, PLANS AND PROGRAMMES

National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006–2016. (See 1.1)

Other programmes and projects: There are number of ongoing processes to improve and support the existing protected area network.

- METSO, The Forest Biodiversity Action Programme for Southern Finland 2008-2016:
  www.mmm.fi/en/index/frontpage/forests/metso.html
- VELMU, The Finnish Inventory Programme for the Underwater Marine Environment,
  http://www.ymparisto.fi/default.asp?node=14055&lan=en
- HELCOM, Baltic Sea Action Plan:
  www.helcom.fi
  http://www.fimr.fi/en/julkaisut/julkaisun_tiedot/en_GB/?p=helcom_ecological
- BALANCE: Baltic Sea Management – Nature Conservation and Sustainable Development of the Ecosystem through Spatial Planning, 2005-2007:
  http://balance-eu.org

OBSTACLES, NEEDS AND FUTURE PRIORITIES

There are some effective measures in place to build up the extent of integration of protected areas to wider concepts in Finland. Habitat loss, fragmentation and weakening of connectivity are not related only with biodiversity but also with the ecosystem services, they potentially provide. Therefore, one of the major focuses in Finland should be on improved mainstreaming the objectives of nature conservation and protected areas in particular to strategies of other natural resource related sectors of the society. Existing measures have often regional and/or thematic focus and thus the state of ecological networks varies widely both geographically and ecosystem by ecosystem.

The ecosystem approach has not yet been applied systematically in Finland although the need to intensify its application has been recognized by the authorities and even though many of its principles are included in the planning procedures already applied today by NHS. For this reason, it is important to examine the related concepts and how such principles are applied and can be further developed in Finland.

The Guidelines on Integrating Protected Areas in to wider land and seascape and sectors being developed with the support of CBD secretariat, aiming at giving guidance to PA practitioners as well as to policy level decision makers, will be taken in to consideration as one tool in resolving the future challenges.

INFORMATION SOURCES:

State of the Parks in Finland report (SOP):
www.metsa.fi/sop
Management Effectiveness Evaluation (MEE):
www.metsa.fi/mee
Saving nature for people - National strategy and action plan for conservation and sustainable use of biodiversity in Finland 2006–2016, 168 p. Ministry of the Environment:
www.ymparisto.fi/default.asp?contentid=258249&lan=EN
Landscape ecological planning:
http://www.envir.ee/natura2000/files/doc/forestry_28-08-2003/Ecological_Planning_of_Sate_Owned_Forest,_Petri_Heinonen.ppt#340, 9, Evaluation of Landscape Ecological Planning
http://www.cbd.int/doc/case-studies/for/cs-ecofor-fi-application.pdf
http://www.metsa.fi/sivustot/metsa/en/NaturalResources/Planningmethods/Naturalresourceplanning/Sivut/NaturalResourcePlanning.aspx
METSO, The Forest Biodiversity Action Programme for Southern Finland 2008-2016:
www.mmm.fi/en/index/frontpage/forests/metso.html
HELCOM, Baltic Sea Action Plan:
www.helcom.fi
- Balance:
  http://balance-eu.org
- HELCOM ecological objectives for an ecosystem approach: the process of defining good ecological status of the Baltic Sea. Scientific publication; Backer, H., and Leppänen J.-M., 2008; Aquatic Conservation: Marine and Freshwater Ecosystems

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Goal 1.3: To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries.

DESCRIPTION OF PROGRESS

Generally, Finland is very active in transboundary cooperation between the actual neighbouring countries, particularly with Russia, and also between the countries around Baltic Sea that share same interest and challenges in achieving common conservation goals particularly. There are a large number of agreements, initiatives and hands-on conservation activities concerning nature conservation over the national borders.

Green Belt of Fennoscandia (GBF). The 1,250 km long border between Finland and the Russian Federation has enabled wide-ranging cooperation between protected areas over the border. This cooperation aims at creating a chain of transboundary parks along the Finnish-Russian border from the Gulf of Finland to the River Paatsjoki in Inari. The protected areas along the *Green Belt of Fennoscandia* form a unique contribution to nature conservation in Europe. Parks in both countries are shown in Figure 2. There are currently four pairs of transboundary parks including Øvre-Pasvik National Park in Norway and further four pairs are projected. The existing active PA collaboration along GBF include1) the internationally acclaimed collaboration between the national parks of Oulanka and Paanajärvi; 2) the Friendship Park in Finland and Kostomuksha Strict Nature Reserve in Russia that together comprise the Friendship Nature Reserve; 3) Urho Kekkonen National Park and Russia's Lapland Strict Nature Reserve and 4) trilateral collaboration between Vätsäri Wilderness Reserve in Finland, Norway's Øvre-Pasvik National Park, and Pasvik Strict Nature Reserve in Russia. The current cooperation also aims at securing the official status for Kalevala National Park in Russia, which was established officially 2007.

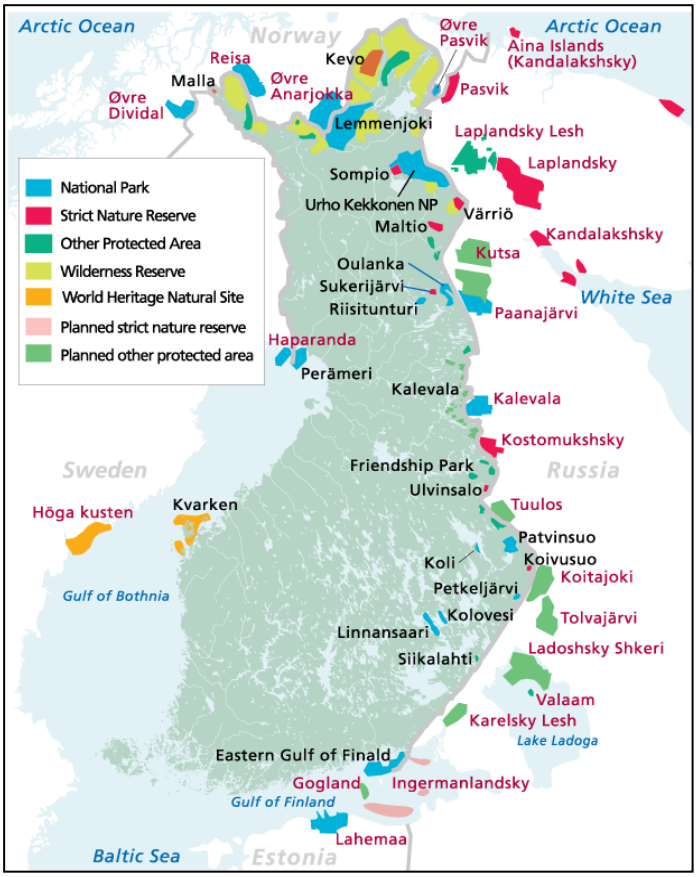

Figure 2. *Transboundary cooperation between Finnish protected areas and areas in neighbouring countries. Source: Metsähallitus.*

Transboundary Protected Areas certified under the EUROPARC Following Nature's Design initiative. Between Finland, Russia and Norway, there are currently two transboundary parks that have undergone international evaluation process by EUROPARC Federation. These include 1) Inari-Vätsäri Wilderness Area (FIN), Øvre-Pasvik National Park (N) and Pasvik Zapovednik (RUS) and 2) Oulanka National Park (FIN) and Paanajärvi National Park (RUS). The cooperation between these parks in three countries was evaluated and they were given a EUROPARC certificate "Following Nature's Design" as a verification of integrity of nature conservation cooperation over national borders. See also chapter 3.3.

PAN Park Nordic-Baltic cooperation between Estonia, Lithuania, Sweden and Finland. There are three (Oulanka NP and Archipelago Marine NP in Finland and Fulufället NP in Sweden) fully certified PAN Parks in Scandinavia belonging to European wide network of "Wilderness Capitals". Few other candidate national

parks in Estonia and Lithuania are aiming at joining the network. January 2009 the Nordic-Baltic cooperation was established in the first meeting at Archipelago NP to deepen the transboundary cooperation between these parks. The aim is to share experiences and best practices and to develop common project proposals for fund raising to secure and improve the level of nature conservation within these protected areas. PAN Park cooperation between certified Oulanka (Finland) and Paanajärvi (Russia) is heading towards recognition of the first transboundary park within PAN Park network.

EUROPARC Nordic-Baltic Section. The cooperation between the members of the network of Europarc Federation Nordic-Baltic Section (NBS) has been ongoing since it was formally established in April 2003. The Section currently brings together about 40 members in the Nordic and Baltic region including national parks and other PAs but also Protected Area Management Agencies like Natural Heritage Services of Finland. This cooperation has been active in many fields of nature conservation e.g. Junior Ranger initiative as tool to engage youth in to conservation work.

World Heritage Natural Sites in cooperation. The High Coast and the Kvarken Archipelago form a transboundary World Heritage Site. In 2009, there were altogether 20 World Heritage Sites that crossed national borders in the World Heritage List, of which 11 were Natural Heritage Sites. Sweden's High Coast and Finland's Kvarken Archipelago are situated on opposite sides of the Gulf of Bothnia and are the most extreme geomorphologic examples of the Baltic area's land uplift landscape.
The Ministry of the Environment of Finland has delegated the coordination of development, management and administration of the Kvarken Archipelago World Heritage Site to NHS. In Sweden, the County Administrative Board of Västernorrland is responsible for the management of the High Coast.

In accordance with the World Heritage Committee recommendation, the County Administrative Board of Västernorrland and NHS appointed a consultation group for the High Coast and Kvarken Archipelago. The group has eight members – four from each country – and it consists of representatives of regional administrative bodies and municipalities. The recently published "governance and development plan"(currently only available in Swedish and Finnish) sets the framework for the cooperation.

Baltic Sea Protected Area Network. An Assessment on the biological and ecological coherence and connectivity of the network of Baltic Sea Protected Areas (BSPA) was undertaken in 2005-2006 to identify gaps in the marine network. Recommendations for further action were given to member states in 2007 and incorporated into the Baltic Sea Action Plan (BSAP). A database of the BSPA areas has been set up to keep track of and analyse governance, biodiversity and management data. Designated sites of the network now (2008) cover 89 areas and 27 400 km^2. In Finland there are 22 sites covering c. 6100 km^2. This means about 23% in both number and area of the network. The Finnish BSPA areas cover about 7.4% of total national marine area. Additional Natura 2000 sites (see 1.1. Marine Protected Areas in Finland) will increase the area under protection (see Indicator BS13: http://www.biodiversity.fi/en/).
In 2009, HELCOM will publish "Biodiversity in the Baltic Sea. Integrated Thematic Assessment on biodiversity and nature conservation in the Baltic Sea" (Baltic Sea Environment Proceedings No. 116B). Included are recommendations for further actions to regional 2010 targets and PoWPA targets by 2012.

RAMSAR - The Nordic-Baltic Wetlands Initiative; NorBalWet; The Nordic-Baltic Wetlands Initiative was formally recognised as a Ramsar regional initiative at the 10th Meeting of the Conference of the Parties to the Convention on Wetlands in Korea, October-November 2008. The following areas are given priority for cooperation: Transboundary cooperation, protection and management of wetlands, including restoration of wetlands, monitoring and assessment of wetland habitats, involvement of stakeholders and other sectors, alleviation of threats and impacts, global action plan for peatlands, compare the nature conservation administration systems in the NorBalWet countries.

Ramsar network in the Baltic Sea Catchment Area (BSCA): A study of the representation of wetland types and species in the Baltic Sea Catchment Area was compiled by WWF Sweden 2008. Within the Baltic Sea Catchment Area.there are 171 RAMSAR sites covering 24 336 $km^2$and corresponding to 1.4% of the total area. In Finnish territory there are 46 RAMSAR sites inside the BSCA but the mean surface area is only 94

km² including marine habitats representing 3.1% of the wetlands and inland waters in the catchment area are located inside the RAMSAR network (see http://www.ramsar.org/wn/w.n.wwf_baltic_report.htm).

Finland is supporting the management of regional protected areas in **North Western Russia**. These PAs include large areas with significant natural and cultural values, but their management resources are limited. This networking between the regions and with Finnish colleagues at Metsähallitus has brought the regional managers together and increased the management capacity.

Finnish-Russian nature conservation working group. Metsähallitus NHS has assisted in organising of and providing expertise in the meetings of the Habitat Contact Forum under the Barents Euro-Arctic Council in 2001, 2003, 2005 and 2008. Metsähallitus NHS has also actively participated in the expert meetings aimed at improvement of Finnish-Russian scientific cooperation along the Green Belt of Fennoscandia (2005), conservation of the large raptors (2005) and conservation of the fresh water pearl mussel (2009) in Fennoscandia.

Estonia-Finland nature conservation cooperation. Metsähallitus NHS has been involved in a joint Estonian-Finnish working group on nature conservation since 1998. The NHS has participated in work to improve nature interpretation and customer service at Estonian nature reserves and visitor centres, as well as the development of management and habitat restoration methods for protected areas among other forms of hands on conservation and administration level cooperation.

OBSTACLES, NEEDS AND FUTURE PRIORITIES

The main challenges that transboundary cooperation faces are differences between countries on legislation, finances and PA objectives. Cooperation is resource demanding and thus the rationale behind cooperation has to solid and activities beneficial for all parties. The need to harmonise management principles, information systems (e.g. joint databases) and monitoring methods is a fundamental aspiration in adaptive transboundary cooperation. In particular, it is challenging between Finland and Russia since the work is carried out over the EU border and for instance the regulations, laws etc. form a considerably strong hindrance towards flexible cooperation between the parks.

INFORMATION SOURCES

Green Belt of Fennoscandia:

Finnish-Russian Nature Conservation Cooperation brochure:
http://www.ymparisto.fi/download.asp?contentid=12231&lan=fi

New steps forward in the protection of the Green Belt at the eastern border of Finland:
http://www.ymparisto.fi/default.asp?contentid=288126&lan=EN

Co-operation on nature conservation in Northwest Russia 1997-2010:
www.environment.fi/nwrussia

"Envelope": Newsletter of the Finnish Environment Institute SYKE
http://mmm.multiedition.fi/syke/envelope/Envelope5/Envelope_5_2008_Green_Belt.php

Transboundary Protected Areas certified under the EUROPARC Following Nature's Design initiative:
http://www.europarc.org/what-we-do/transboundary-parks-following-natures-design

System of Coastal and Marine Baltic Sea Protected Areas; BSPA:
www.helcom.fi;
http://helcom.navigo.fi/Recommendations/en_GB/rec15_5/

PAN Park Nordic-Baltic cooperation between Estonia, Lithuania, Sweden and Finland:
www.panparks.org ; http://www.panparks.org/Newsroom/News?page=details&oldal=1&news_id=270)

EUROPARC Nordic-Baltic Section:
http://www.europarc-nb.org/

Ramsar - The Nordic-Baltic Wetlands Initiative:
http://www.norbalwet.org/side.cfm?ID_kanal=11
http://assets.panda.org/downloads/wwf_ramsar_report.pdf

World Heritage transboundary sites:
http://www.kvarken.fi/In_English/The_Kvarken_Archipelago
http://www.kvarken.fi/Suomeksi/Merenkurkun_saaristo/Hallinto/Hallinto_ja_kehityssuunnitelma

Goal 1.4: To substantially improve site-based protected area planning and management.

DESCRIPTION OF PROGRESS

Generally, nearly all Finland's PAs are managed by one government agency Natural Heritage Services of Metsähallitus including most of the private PAs. This fortunate situation allows the planning and management of the Finland's PAs in State owned lands in particular to be consistent, well organized and mainstreamed. In addition, all PAs are managed by following the same principles that are set in the "Guidelines on the Aims, Function and Management of State-owned Protected Areas". Adaptive management approach is at present seen as one of the most important measure in management and forms a basis of day-to-day work of NHS.

Protected area management planning. Management planning guidelines have been written in Finland (by Metsähallitus) in 2003 and updated several times. The latest revision has just been completed in spring 2009 in which the focus is more on adaptive management planning approach where the appropriate changes to the plan are easily integrated without too heavy and resource demanding processes (see also 1.2. Management planning process). The planning process and documentation is uniform and always involves stakeholder and public participation. Science-based determination of site values (also other values in addition to those listed in the Habitats and Birds Directives, including socioeconomic ones when relevant), threat analysis and establishment of conservation (as well as socioeconomic and governance) objectives and targets, are part of the process. Planning of necessary actions and the monitoring of both their implementation and impacts are also involved. According to the legislation (Nature Conservation Act and Wilderness Act) each National Park, Wilderness area and some National Hiking Areas are obliged to make management plans that are being evaluated by the Ministry of Environment. This has also led to the process where Metsähallitus NHS are constantly renewing and improving the quality of the management planning process.

Since 2004, the number of management plans (MPs) has doubled and the area covered by MPs nearly tripled (see figures 3 and 4). Of the MPs required by law in Finland, about two-thirds are completed. New MPs are drafted annually on average for 30 Natura 2000 sites. A detailed work plan for the drafting of the necessary MPs for Finnish sites was established in 2007. The objective is to complete the required plans for PAs on state land by 2012.

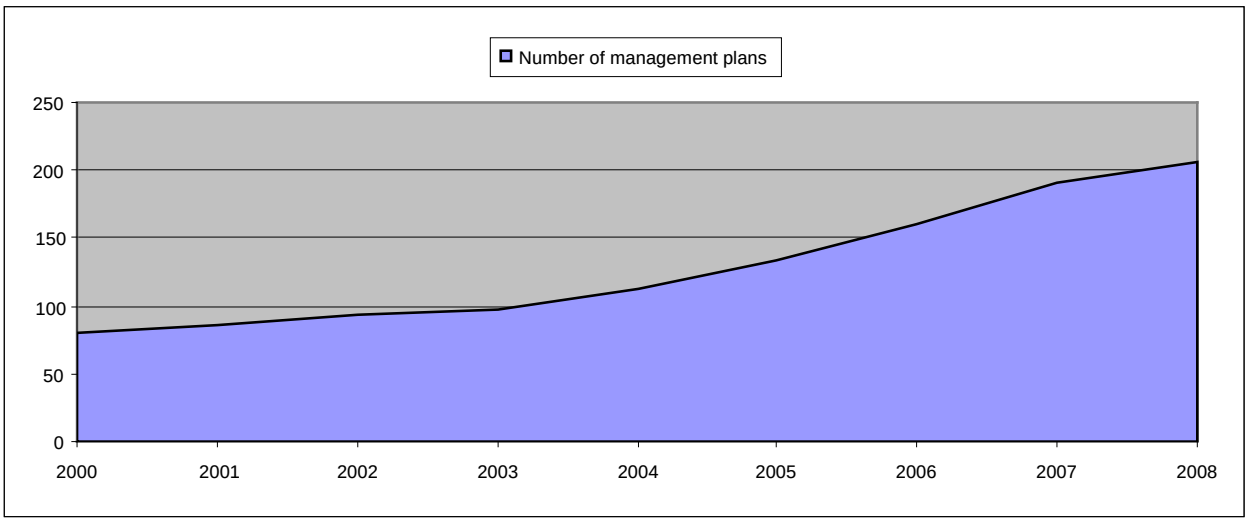

Figure 3. *Number protected area management plans 2000-2008. Source: Metsähallitus*

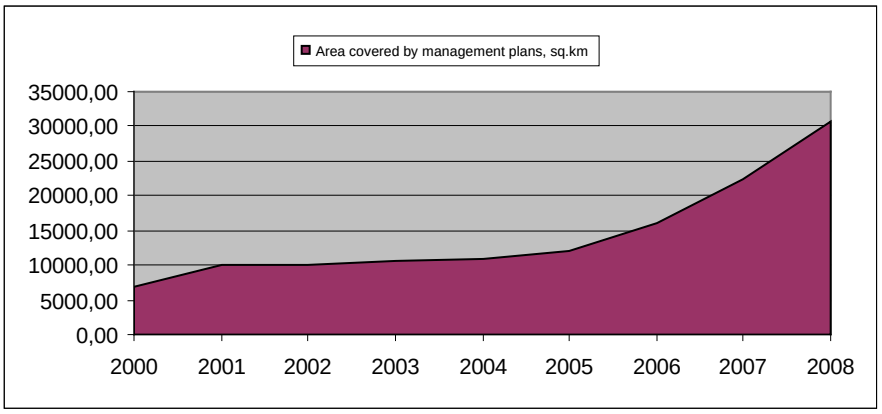

Figure 4. *Area covered by protected area management plans 2000-2008. Source: Metsähallitus*

According to provincial Natura 2000 General Plans, a formal management plan (which follows the present planning guidelines) was at the beginning of 2008 still needed for about 30% of the total number of Finland's Natura 2000 sites. The great majority of these sites are located in Southern Finland and average area of these southern sites is rather small. For this reason, planning is now done predominantly by grouping several sites in one management plan. This increases cost-efficiency and productivity and enhances regional planning. Many issues can be dealt with more insight when looked at in a larger scale. Also working with stakeholders is easier, when every site is not discussed separately. The goal for integrated management is realised better.

Inventories of species. NHS has begun extended inventories of species, especially of formerly poorly known species groups such as invertebrates, lower plants and fungi (link also to GSPC Target 1) and birds as a part on METSO programme (2008-2016). Inventories are targeted to habitats that will be managed for improving their biodiversity values or to habitats that are at the moment important for threatened species. Special attention is given also on developing methodologies and technologies of inventories (see 3.2 and 4.1). NHS national monitoring programmes for six priority species listed in Nature Conservation Act (Saimaa Ringed Seal, Arctic Fox, White-backed Woodpecker, Golden Eagle, Gyr Falcon, Peregrine Falcon) are very comprehensive and they were conducted also outside protected areas. Results of inventories and monitoring are used in management and conservation planning processes and assessments of sites, protected area network and species.

Monitoring and assessment of protected area values. The Natural Heritage Services is presently working on establishing a systematic monitoring and assessment scheme at site level to follow how well the (nature) conservation values (and other values) of each site are maintained, and how the management planning and implementation of plans is supporting and impacting the status. The method and procedure is still under development, but the idea is to monitor continuously and assess each site once every six years, taking into consideration the site-specific and over-all status of habitats and species. In the spirit of adaptive management, this assessment should also judge the consequent need for further action and refinement of management plan(s). The site-specific monitoring and assessment information is used also for Management Effectiveness Evaluation (MEE) and State of the Parks (SOP) reporting both at PA site and system level. (See also 4.2. and 4.3.)

PA objectives. In general, all PAs have defined management objectives. In accordance with the Nature Conservation Act, the management plans and operational regulations should clearly identify the official objectives of each PA. Naturally, only the sites with relevance in regards to intervention / non-intervention management measures have complete management plans and spelled out objectives and there is a great number of smaller-scale PAs (e.g. IUCN management category IV protected mires) with little documentation although they are protected by law and objectives are clear.

Specific Action Plans: Management plans are supplemented with specific action plans that guide the implementation of tasks like restoration needs identified in management plan. They also include e.g. threat analyses, evaluation of the effectiveness, and plan for participation and monitoring plan when appropriate.

OBSTACLES, NEEDS AND FUTURE PRIORITIES

Current situation is that management plans will need to be drafted for some 200 protected areas on state land over the next few years. Even though combined plans can be drafted for groups of areas, the task ahead is still demanding. 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 setting of specific objectives for each individual PAs is a challenging and can be questioned as a necessity. However the new NHS guidelines for management planning will help this process. Also new IUCN guidelines on PA management categories clarify designation and help to overcome some previous obstacles in the objective setting.
Generally, the challenge for site-based PA management to find the most suitable approach in relation to transparency and participation applies also in Finland and the potential of applying co-management approach should have thorough discussions to scrutinize the options.

INFORMATION SOURCES

State of the Parks in Finland report:
www.metsa.fi/sop
The Nature Conservation Act:
http://www.finlex.fi/en/laki/kaannokset/1996/en19961096?search%5btype%5d=pika&search%5bpika%5d=%20conservation%20act
The Wilderness Act:
http://www.metsa.fi/sivustot/metsa/en/NaturalHeritage/ProtectedAreas/WildernessAreas/Sivut/WildernessAreasinNorthernFinland.aspx
Principles of Protected Area Management in Finland. Guidelines on the Aims, Function and Management of State-owned Protected Areas (2002, English, revised 2007, in Finnish only):
http://julkaisut.metsa.fi/julkaisut/pdf/luo/b054.pdf
http://julkaisut.metsa.fi/julkaisut/pdf/luo/b89.pdf

Goal 1.5: To prevent and mitigate the negative impacts of key threats to protected areas.

DESCRIPTION OF PROGRESS

In general, the major threats to Finland's protected areas are similar to the overall global threats to biodiversity: the economic exploitation of natural environments e.g. forestry and habitat conversion; climate change, invasive alien species, eutrophication and pollution. By definition nature reserves in Finland, including National Parks and Wilderness Reserves (which together cover 2.3 million ha), have no inhabitants and no logging. In Northern Finland controlled reindeer husbandry and subsistence hunting is allowed. In principle, no land use that can threaten the conservation status of any of the listed nature values of Natura 2000/national nature conservation sites, for which the sites have been designated, is allowed.
Measures to prevent and mitigate these threats are taken by all authorities responsible of biodiversity related matters as mainstreamed manner. In addition, there are also other less complex threats to protected areas such as unsustainable tourism in overcrowded sites. There are various measures taken by NHS to address these less complex, in many cases site based threats to safeguard the integrity and values of the protected area(s) in question. These include, among others, threats of overgrazing, off road traffic, hunting and fishing. and regular MP implementation assessments made. Adaptations to plans and actions are made as necessary. Pressures imposed on different habitat types are reflected also by biodiversity indicators (www.biodiversity.fi).

Threat identification and actions. As part of the site specific monitoring and assessment of the state of protected area values (see 1.4), also the critical pressures and threats on those values are defined. Based on rapid assessment and analysis in 2004, the major pressures and threats were identified for each of 70 Finnish national parks, strict nature reserves and wilderness reserves. These are shown in Figure 5, combined for the three different NHS regional units.

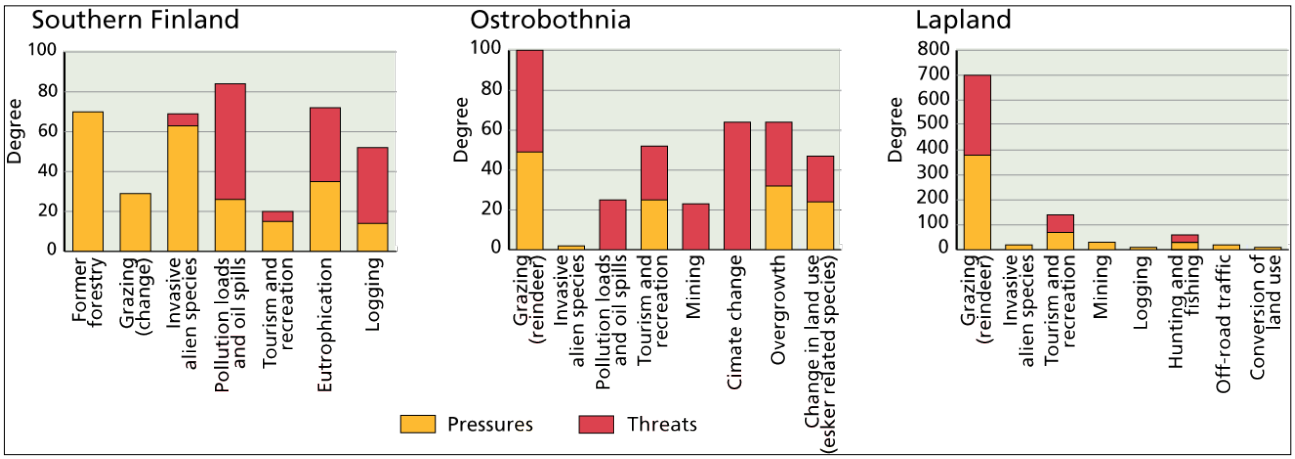

Figure 5. Pressures and threats affecting protected areas in Finland. *Note impact scale of reindeer grazing in Lapland in comparison to other areas and pressures. Source: Metsähallitus, State of the Parks.*

Site based analyses on threats within Management Planning Process. Actions to prevent and mitigate impacts of competing or harmful land use and other pressures inside, and to a limited extent also outside, protected areas are prescribed in management plans and implemented consequently. These actions may include:

- land use zonation (non or restricted use/remote limited use/directed recreational use) as part of management planning
- PA regulations and local restrictions to land use (e.g. time-limited)
- habitat restoration (forest, mire, inland waters) and habitat/species management (traditional agricultural biotopes)
- alien species control and eradication
- planning for low-impact visitor facilities
- visitor impact monitoring and control
- land and resource use agreements and permits

Each management plan includes threat analysis to address the existing and potential threats to the planning site. Analysis includes all threats and evaluates the pressures and the future trends for each of them. The management plan is designed to focus on means to avoid, remove or at least mitigate the impact s of the current threats. Management actions and their impacts are monitored

Principles for Sustainable Nature Tourism. NHS has taken the potential threats regarding the recreational use of the parks seriously. The principles for Sustainable Nature Tourism are to guide the operations of Metsähallitus in protected areas as well as to be followed by all nature tourism based businesses acting within PA premises. The document also provides explanations to illustrate how these nine principles are put into practice.

Sustainable Tourism Development Strategies (STDS) and Sustainable Nature Tourism Plans. Within Finnish PA system, there is a growing number of strategies and plans to address the sustainable tourism challenge in protected areas located in regions where the tourism pressure is high. By the end of 2009, there are approximately ten national parks that have finalized the plan. The goal is to have completed by 2012 c. 15-20 plans to cover all protected areas critical in terms of threats from growing number of visitors.

The plan needs to be updated every three to five years. These plans are prepared in close cooperation with nature tourism oriented local enterprises and regional tourism associations and other relevant stakeholders.

Limits of Acceptable Changes (LAC). In relation to the human impact in terms of recreational and local traditional use of protected areas are increasingly monitored by using different methodologies. Limits of acceptable changes (LAC) methodology has proven to be useful especially when linked with indicators that relate to the Principles of Sustainable Nature Tourism and Sustainable Nature Tourism Plans. The LAC represents a practical tool to help monitor changes in the state of protected areas and identify suitable actions to mitigate unfavourable changes. There is a principle decision within NHS that all PAs with a tourism plan needs to use the LAC method in order to carry out adaptive planning approach.

Alien invasive species control. The protected area manger is responsible of recognizing the potentially harmful alien invasive species and take action to remove the threat. NHS is continuously monitoring and identifying the potential risks and needed management measures are in place.
The preparation of national strategy on invasive alien species has been started under coordination of Ministry of Agriculture and Forestry. The established steering group is responsible of the groundwork based on the expertise provided by issue-specified expert groups. The work is scheduled to be completed by the end of 2010.

Climate Change challenges. During 2008 Metsähallitus enterprise run a climate change study to foresee the challenges awaiting it in the changing natural, societal and business environment. As part of that work Metsähallitus NHS prioritised its actions to be taken in the coming years for the sake of better conservation of biodiversity. NHS makes its share in the European Nature Conservation Agencies (ENCA) working group Biodiversity and Climate Change, started in 2009. In addition, the Natural Heritage Services has recently established internal Climate Change Network, which functions as a discussion forum to address the challenges PAs are facing.
A research programme on adapting to climate change, with ancillary activities such as gathering basic information of importance for monitoring and policy making with respect to protected areas, will be implemented by the by the year 2010 as a responsibility set for Ministry of Environment.

Natura 2000 sites. Nature Conservation Act sections 65 and 66 set the measures to be taken when assessing projects and plans (65) and granting of permits and adaptation and ratification of plans. Section 65 explicitly says that if a project or plan is likely to have significant adverse effect on the ecological value of a site included in the Natura 2000 network, and the site has been included in the Natura 2000 network for the purpose of protecting this ecological value, the project's planner or implementer is required to conduct an appropriate assessment of its impact. The same shall correspondingly apply to any project or plan outside the site, which is liable to have a significantly harmful impact on the site. Section 66 states that no authority is empowered to grant a permit for the implementation of a project, or to adopt or ratify a plan, if the assessment procedure or the requested opinion referred to in section 65 indicates that the project or plan would have a significant adverse impact on the particular ecological value for the protection of which the site has been included in, or is intended for inclusion in, the Natura 2000 network.

Environmental Impact analyses (EIA): In Finland environmental impacts are routinely evaluated as an integral part of land use planning, and in assessments carried out in relation to Natura 2000 protected areas sites under Section 65 of the Nature Conservation Act (see above).

OBSTACLES, NEEDS AND FUTURE PRIORITIES

Major challenge regarding to the threats to protected areas in Finland is to champion the global changes threatening the biodiversity overall. The mainstreaming and incorporating these challenges in to strategies and action plans of all sectors of society remain the greatest challenge in achieving the conservation goals. One exemplary constrain in northern Finland concerns recreation and local communities. The challenge is how to combine reindeer herding and other subsistence use of natural resources with nature tourism

activities related to e.g. sled dog tours. There is a need to clarify the depth of this obstruction and create guidance for better amalgamation in the future. Growing tourism also needs to be considered as a potential threat to biodiversity especially in the most vulnerable areas in the north with numerous endemic and threatened species – in both flora and fauna.

INFORMATION SOURCES

Principles for Sustainable Nature Tourism:
www.metsa.fi/sustainablenaturetourism
LAC / State of the Parks in Finland report
www.metsa.fi/sop
Saving nature for people - National strategy and action plan for conservation and sustainable use of biodiversity in Finland 2006–2016, 168 p. Ministry of the Environment,
www.ymparisto.fi/default.asp?contentid=258249&lan=EN
Assessment of threatened habitat types in Finland
http://www.ymparisto.fi/default.asp?contentid=301807&lan=EN
http://www.ymparisto.fi/default.asp?contentid=283750&lan=en&clan=en

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PROGRAMME ELEMENT 2: Governance, Participation, Equity and Benefit Sharing

Goal 2.1: To promote equity and benefit sharing.

DESCRIPTION OF PROGRESS

In general, the management of Finland's network of protected areas by NHS is mainly financed by the government from the State budget. Other public funding includes EU run programmes in promoting nature conservation. In addition there are very limited funds through some services and sales for visitors. There are no entrance fees or any other types of noteworthy revenue making mechanisms for protected areas and thus there is no direct financial income for the management authority. However, there are a number of issues regarding the establishment and regulations to be agreed with the local communities and landowners and also to be compensated when appropriate.

"Everyman's rights" in PAs. In most PAs in Finland, people of all nationalities have the right to enjoy the Finnish nature freely under the traditional concept known as everyman's right**.** Special regulations in National Parks and Strict Nature Reserves in particular, additionally limit activities such as camping, hunting, the use of motor vehicles, and access to sensitive areas during the nesting season. Such restrictions are set separately for each area. However, wild berry and mushroom picking is allowed in most areas, even in National Parks outside of strictly protected zones.

The Wilderness Act. Wilderness areas were established not only to protect the wilderness character of the areas but also to safeguard indigenous Saami culture and traditional subsistence uses and to develop the potential for diversified sustainable use of nature. Finland has given a specific Act (1991) on Wilderness areas as one category of protected areas. The Wilderness Act prohibits heavy development that would change nature significantly, yet it aims at improving possibilities for traditional uses of nature. This is to guarantee that the indigenous Saami can continue their traditional lifestyle and reindeer herding practices regardless of the protection of the area they are living.

VILMAT Action Plan. In 2003, a Government resolution launched an Action Plan to Develop Nature Tourism and the Recreational Use of Natural Areas (VILMAT). The main objective of this plan is to double the number of jobs in these fields by 2010. As the administrator of State-owned lands and waters, Metsähallitus is playing a major role in the realisation of the VILMAT Action Plan. Many extensive actions have already been implemented, including the building up of partnerships and collaborative networks with local operators, and efforts to improve data management in the context of supply and demand for

recreational activities and nature tourism. Special tools have also been devised to help ensure that nature tourism is sustainable.

Focal areas with potential for significant sustainable tourism development. To support the VILMAT Action Plan the NHS has drafted development programmes to promote recreational activities and nature tourism in protected areas, national hiking areas and State-owned waters. It is intended that these programmes should be implemented within existing funding frameworks. To improve the effectiveness of such measures the NHS has identified several focus areas that are potentially most suitable for development of sustainable nature tourism, where specific growth and employment targets are defined (Figure 6). Protected areas in regions where tourism is expanding account for approximately 90% of all visits to State-owned areas, and 97% of the ongoing increase in visitor numbers. The regional employment impact of Metsähallitus's recreation and nature tourism focus areas was considered to be about 3,400 person-years in 2003. After further investments in facilities in protected areas and increases in visitor numbers, the total employment impact is expected to rise by about a thousand person-years by 2010. 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 estimates 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 are expected to attract 90% of the increase in the numbers of visits. NHS is not collecting any revenue from tourism but all its supportive activities are aiming at creating enabling environment and economy in these mostly remote regions where tourism is by far the most potential source of income for local communities.

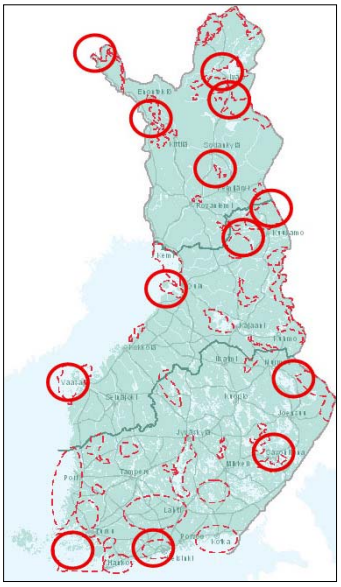

***Figure 6**. Focus areas under management of NHS that are potentially most suitable for development of sustainable nature tourism, where specific growth and employment targets are defined.*

***The even lined** (thick stroke) circles indicate the existing and most rapidly developing tourism destinations within the network of PAs in Finland.*

***The dash-lined** (thin stroke) circles indicate potential focus areas for sustainable development of tourism within the network of PAs in Finland.*

Compensation for reindeer owners for the economic loss caused by protected predators. There is a full compensation scheme, which covers the value of each reindeer killed by strictly protected large carnivores such as brown bear (*Ursus arctos*), wolf (*Canis lupus*) and wolverine (*Gulo gulo*) and lynx (*Lynx lynx*). Currently the compensation is double the actual value of a reindeer. Revision in the Finnish compensation scheme has become necessary as the populations of large carnivores have increased due to the protection measures required under the Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC, the Habitats Directive), resulting in more frequent damage to reindeer. Consequently, the significance of compensation paid out for losses to the reindeer owners has also increased. In the revised compensation scheme, instead of a double compensation, a sum corresponding to 1.5 times the market value of the reindeer would be paid out to the reindeer owner, and the remainder would be reallocated through compensation for loss of reindeer calves and special compensation to reindeer herding cooperatives, which have sustained heavy losses. The excess in the compensation scheme would also be replaced by a compensation threshold. In other words, compensation would be paid out in case the total losses of an applicant in a calendar year exceed 170 euros. The scheme will come into force at 1.12.2009.

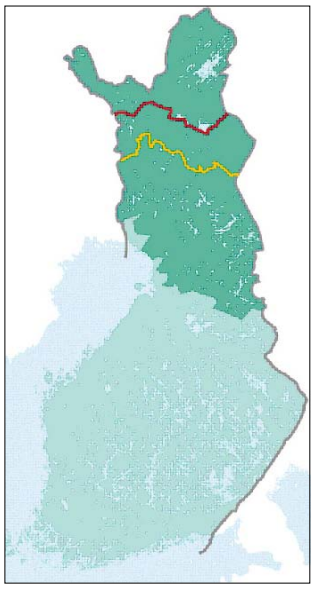

Figure 7. *Reindeer husbandry area in Finland. Area north of* ***yellow line*** *is specially intended for reindeer herding,* *north of* ***red line*** *is the Homeland of the Saami people.*

NHS services for tourism business sector. In Finland tourism entrepreneurs can use protected areas freely for nature tourism activities as long as they follow the code of 'everyman's right', which in principle means not causing harm. However, if services such as firewood and/or waste management are used, the special permission is needed from the PA management. The aim of NHS is to sign partnership agreement with all entrepreneurs who are providing their services relying on PAs. Currently (2009) NHS has c. 250 signed partnership agreements and they serve as a tool to secure the sustainability of nature-oriented tourism in protected areas. Agreement binds the partners to follow the nine principles of sustainable tourism for protected areas developed by NHS by participatory approach.

Full compensation scheme. Prior to new protected areas are established by Metsähallitus NHS, the land area must become a property of the State and thus need to be claimed and purchased from the current landowners. However, there is a full compensation scheme in place to pay compensation to the landowners to avoid any bias decisions.

OBSTACLES, NEEDS AND FUTURE PRIORITIES

In the current legislation, the basis of the compensation regarding Golden Eagle caused damage differs to that of the other predators. Golden Eagle compensations are based on the protection of biodiversity while Brown Bear, Wolf, Lynx and Wolverine compensations are classified as agricultural subventions. The Finnish Saami (Saami) Parliament endorses the initiative, for the sake of consistency, to simplify the scheme to compensate all predator damage solely reasoned for biodiversity conservation. The new “Act on compensation for damage caused by game animals (105/2009)” will come into force at 1.12.2009.

INFORMATION SOURCES

Decision by the Government of Finland (In Finnish only) of the establishment of Vilmat Programme:
http://www.ymparisto.fi/download.asp?contentid=9179&lan=FI
State of the Parks in Finland report:
www.metsa.fi/sop

Sustainable tourism in PAs of Finland:
http://www.metsa.fi/sivustot/metsa/en/NaturalHeritage/ProtectedAreas/SustainableNatureTourism/Sivut/SustainableNatureTourisminProtectedAreas.aspx

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Goal 2.2: To enhance and secure involvement of indigenous and local communities, and relevant stakeholders.

DESCRIPTION OF PROGRESS

All PAs managed by NHS are in state-owned land and without inhabitants. This unusual situation has been preventing potential day-to-day conflicts between the local people and NHS. There are some noteworthy measures in place in order to guarantee the local participation in PA management listed below.

Examples of legal obligations and volunteer activities to improve the level of involvement.

Legal obligation to negotiate with Saami Parliament and reindeer herding co-operative. Based on the Act on the Saami Parliament, the authorities shall negotiate with the Saami Parliament in all far-reaching and important measures, which may directly and in a specific way affect the status of the Saami as an indigenous people.
In Addition, in the Act on Metsähallitus is stated that the management, use and protection of natural resources shall be adjusted to fulfiling the obligations laid down in the Reindeer Husbandry Act. In this Act, the main concern in regards to PAs is *Consulting obligation,* in which it is stated that all planning measures concerning State land that will have a substantial effect on the practice of reindeer herding, the State authorities must consult the representatives of the reindeer herding co-operative in question.

Governance strategy for The Kvarken Archipelago: The principles concerning cooperation in governance issues of Kvarken World Heritage site have been developed and agreed. This is a unique strategy including co-management elements between all relevant local stakeholders.

Translations to Swedish and Saami languages: There is a legal obligation for NHS to have all the informative material (incl. environmental education) and guidance translated to Swedish language in the whole country and also to translate them to Saami languages in northern areas where Saami people are living. In addition, the linguistic minority of Swedish-speaking Finns have right to be served in their mother tongue in NHS visitor centres and other customer service points. This applies also the Saami Homeland Area. NHS has a comprehensive up to date web service on PAs in Finland, which is fully translated to Swedish and from the essential parts also to Saami languages.

Protected area cooperation groups: There are some obligatory (like UKK NP) and some volunteer based local cooperation groups established between the PA management authority and all relevant stakeholders. Cooperation group meetings are fora for discussing the important management related issues. In most cases, the groups have more advisory role but in some parks, they have also decision-making power and thus form a co-management platform.

Co-managed PAs: Private protected areas in Finland are co-managed in practice. The management plans are mainly the responsibility of NHS and the day-to-day cooperation happens between the regional environment centres and the landowner.

Official cooperation agreements: NHS has official framework agreements between the Reindeer Herders' Association, Island Committee and other important stakeholders, partners and sectors to guarantee that the management of PAs is participatory.

Management planning process: As a whole, the NHS management planning process is based on participatory approach. (See 1.2.).

OBSTACLES, NEEDS AND FUTURE PRIORITIES

The challenges regarding to this target are mostly of global nature. In Finland, the co-management approach including decision-making mechanisms and management planning and practices needs close re-evaluation in terms of involving local and indigenous communities and other stakeholders in practice. At the moment, the principle tools and the practices of NHS (management planning, co-operation groups etc.) do involve relevant interest groups as part of participatory means in management planning and decision-making. However, there could be more focus on how to find a way to develop measures for co-management of PAs as it is seen from wider perspective. One of the challenges in Finland is that the social, cultural, economic and ethnical circumstances vary so much from south to north of the country, thus creation of common guidelines or policy may not be feasible. The size and the relevance of the PAs, the land ownership patterns, the number and the nature of relevant stakeholders etc. vary a great deal within the country.

INFORMATION SOURCES

Translations to Swedish and Saami languages:
www.utinaturen.fi
www.lundui.fi
Governance strategy for The Kvarken Archipelago WH-site (currently only in Finnish and Swedish)
http://www.metsa.fi/sivustot/metsa/fi/Luonnonsuojelu/Hoidonjakaytonsuunnittelusuojelualueilla/Hyvaksytytsuunnitelmat/2009hyvaksytyt/Merenkurkku/Sivut/Merenkurkunhs.aspx
Act on Metsähallitus:
http://www.finlex.fi/fi/laki/kaannokset/2004/en20041378.pdf
Reindeer Husbandry Act:
http://www.finlex.fi/fi/laki/kaannokset/1990/en19900848.pdf
Act on the Saami Parliament:
http://www.finlex.fi/fi/laki/kaannokset/1995/en19950974.pdf

PROGRAMME ELEMENT 3: Enabling Activities

Goal 3.1: To provide an enabling policy, institutional and socio-economic environment for protected areas.

DESCRIPTION OF PROGRESS

Most importantly, nearly all Finland's PAs are managed by one government agency Natural Heritage Services of Metsähallitus, NHS. This provides environment for consistent work in management and planning as well as focused strategies and action plans for achieving not only national but also international conservation goals. The organization structure is based on one hand on regional units, which are in charge of actions and, on the other hand steering units for key processes being responsible for standardization of working methods and developing of appropriate guidelines. One important development is regionalization leading more political strength to provincial governments and authorities. This suits NHS regional organisation to units and provides good grounds to develop common regionally important plans and projects and it also creates enabling environment not only in policy level but also from financial standpoint.

Employment and support the local service providers. NHS, especially in the northern parts of the country is a significant employer. In many cases, the work of NHS in remote places provide work and potential for nature oriented tourism business development. In addition, NHS by buying local services supports the local economy.

Finnish Tourism Strategy 2020 was developed at 2005 - 2006 and implementation started at the beginning of 2007. The strategy indicates how tourism sector has integrated biodiversity goals to its vision and how well cooperation with environment sector works. One of the main justification for strategy is to secure the biodiversity and cultural values. These values are well noticed also in vision, implementation and monitor-

ing - leading to overall aim to develop sustainable tourism destinations. Ecological sustainability and conservation goals are well noticed in the impact assessment and monitoring of the Tourism Strategy. However, National Parks and other protected areas are not so much promoted in strategy, as it is more focusing the overall beauty of Finnish nature and authenticy of cultural heritage. Since the development of Finnish Tourism Strategy 2020, there have been new approaches in cooperation between nature conservation and tourism industry. National Parks and other attractive PA's are better integrated to Finnish tourism destinations and clearly part of tourism brand of Finland.

Strategic and operational cooperation: NHS is a vital part of comprehensive network of biodiversity conservation focused organisations and institutes, which work closely together. These include e.g. Finnish Environment Institute (SYKE), Universities (both national and international), Finnish Forest Research Institute, Regional Environmental Centres and Finnish Game and Fisheries Research Institute. Through this cooperation, there is a strong legal framework to support the efficient and effective management of Finland's network of protected areas.

Monitoring of the State of the Protected Areas: The new measure for monitoring the current status and trends of Finland's PAs is under development (see also 1.4. Monitoring and assessment of protected area values). One of the aims is to create system to facilitate PA managers to apply swift and timely adaptive management measures. The suite of indicators will include a set that focuses solely to assess economic benefits PAs are providing locally. The indicators will also include a set that focuses also to social and cultural aspects to make sure that the network of PAs are integrated to take the sectoral interests in to account.

Money Generation Model (MGM2). By 2010, the NHS together with The Finnish Forest Research Institute aim is to have completed the evaluation process using a single method to make evaluation on how beneficial – in economic terms – the protected areas are; National Parks and National Hiking Areas in particular. The specific tool, currently under the final stage of development, is a built on existing MGM2 tool (Money Generation Model) estimating the economic impacts of protected area visitor spending on a local region. MGM2 estimates the impacts that park visitors have on the local economy in terms of their contribution to sales, income and jobs in the area. The new tool produces quantifiable measures of PA economic benefits that can be used for planning, concessions management, budget justifications, policy analysis and marketing. It will be also applicable to evaluating management, policy and marketing alternatives, both inside and outside the park. Economic impact information has proven quite helpful in fostering partnerships within the community and garnering support for park policies and interests. The economic analysis also helps to identify the roles the PA, local community and tourism businesses play in attracting and serving visitors.

VILMAT Action Plan. The Action Plan to Develop Nature Tourism and the Recreational Use of Natural Areas (VILMAT). The main objective of this plan is double the number of jobs in these fields by 2010. As the administrator of state-owned lands and waters, Metsähallitus is playing a major role in the realisation of the VILMAT Action Plan. Many extensive actions have already been implemented, including the building up of partnerships and collaborative networks with local operators, and efforts to improve data management in the context of supply and demand for recreational activities and nature tourism. Special tools have also been devised to help ensure that nature tourism is sustainable. This action plan plays a critical rope when creating enabling environment in the remote regions where PAs are large and the potential for tourism is big.

OBSTACLES, NEEDS AND FUTURE PRIORITIES

Socio-economic issues related to Finnish PA system governed by NHS are on one hand not as critical as they are in many other parts of the world. This is due to the fact that the management of Finland's PA system is mainly financed by the state and there is no significant revenue generating practices by the manager in place. NHS do not collect entrance fees, do not provide business based activities for visitors or run hospitality services at the Visitor Centres. The potential income from tourism is channelled to support the

local economy. However, the challenge is to create local and regional enabling environment to support common policymaking and joint decision-making measures by finding a feasible way for effective co-management of the PAs. Another challenge is to find the balance between conservation and local rights for subsistence use of natural resources. The baseline, in these matters, has to be set at sustaining favourable conservation status. The usage of any kind should not threaten any of the PA management objectives from biodiversity point of view.

INFORMATION SOURCES

State of the Parks in Finland report
www.metsa.fi/sop
Finnish Tourism Strategy 2020 (in Finnish only, abstract in English)
http://ktm.elinar.fi/ktm_jur/ktmjur.nsf/all/3D61DB118241A034C22571800022FEC4?opendocument
Money Generation Model 2 (MGM2):
http://web4.msue.msu.edu/mgm2/default.htm
Decision by the Government of Finland (In Finnish only) of the establishment of Vilmat Programme:
http://www.ymparisto.fi/download.asp?contentid=9179&lan=FI

Goal 3.2: To build capacity for the planning, establishment and management of protected areas.

DESCRIPTION OF PROGRESS

The NHS as a nation wide organisation has recently (2005) gone through major organisational changes where all fields of work were evaluated and capacities needed were identified. Organisational structure was then built to meet the requirements to support the efficient and effective management of Finnish protected area system.

NHS as only non-business-like run unit of Metsähallitus has been benefiting of the shared best practices and measures by other business units, especially from forestry. Practical examples of this development include e.g. the use of consultancy when appropriate and applying strategic and vision based approaches in strategic planning and operations. In addition, GIS system as well as other IT-tools is developed together with business units, which has proved to be cost-efficient solution. Joint planning processes and shared databases with businesses have enabled the efficient use of ecosystem approach in provincial natural resources planning.

Organisation wide international cooperation. As depicted in the description for Goal 1.3., NHS with other authorities responsible for biodiversity conservation show particular activity in international scientific, administrative or management issues related cooperation. Long-term commitment in international cooperation in transboundary, Europe wide and worldwide work has been significant feature in building the capacity of NHS staff. The important roles in international organisations played by NHS staff include e.g. positions as the member of EUROPARC council, the vice chair of IUCN World Commission on Protected Areas (WCPA), the National Focal Point on CBD PoWPA among others. In addition, there has been a lot of consultancy conducted by NHS staff members in different countries of the world like Russia, China, Korea, Lithuania and Estonia. The amount of capacity build through these fora is remarkable in individual levels and is disseminated through well-structured organizations. NHS also directs capacity-building efforts through its transboundary and bilateral cooperation with the neighbouring countries.

Capacity building programmes.

> **Training program for guides and rangers.** Oulanka National Park conducted a pilot training programme for the staff, local business partners, individual guides and other stakeholders. The lessons learned (description available in Finnish only) will guide the PA network-wide process in improving the local capacity to support the potential implementation of co-management scheme as well as to support the local economy.

Communication. In the winter 2008-2009 three training courses for NH nature conservation fieldwork staff were arranged for the improvement of communication capability, capacity for collaboration with private landowners and media friendliness. Methodological education was given by competitive professionals.

Workbook on fieldwork. The training resulted in detail description of best practices concerning fieldwork. It was conducted as a project that was involving all permanent staff members dealing with the fieldwork challenges. The main outcomes were to find consensus on the nature of the work, to identify relevant stakeholders, to set goals for future, to share best practices and to get a realistic picture on professional potential to advance in this field of work. The actual workbook formed a good base for innovative development, to increase the value of the fieldwork, to create coherent working methods and cost-effective thinking.

Workbook on customer services. NHS has developed (2003) classification and standards of customer service in Visitor Centres. Classification gives guidelines for renewing existing and building new Visitor Centres and other customer service points. Standards of customer service make it easier to develop Visitor Centres as a known brand.

OBSTACLES, NEEDS AND FUTURE PRIORITIES

The improved capacity needs in relation to the hands-on nature conservation are obvious and a matter of constant focus. The challenge is on how to take in to consideration the needs for improved capacity outside of the management authority to support the integration of PAs and mainstreaming the importance of PAs to other sector's work. Environmental education, inclusion of other sectors in PA management (co-management approach) and common training and capacity building schemes will be the future priorities for NHS in regards to capacity building issues. In addition, NHS needs to improve the understanding of socio-economics and cultural dimensions in regards to the conservation work to mach with the already high-level capacity on biological sciences and basic PA management skills.

Goal 3.3: To develop, apply and transfer appropriate technologies for protected areas.

DESCRIPTION OF PROGRESS

NHS uses many IT/GIS-systems that are developed for the whole Metsähallitus-group. These include among others the system used for the management of real estates and land use units and the system used for the forestry business operation of Metsähallitus. The latter system is used in NHS for management of habitat data. NHS has also independently developed IT/GIS systems: for management of trails and infrastructure (REISKA), for management of visitor information (ASTA) and for management of hunting and fishing possibilities and permits. All the above-mentioned IT/GIS-systems are also used in the management planning of PAs, but at present NHS has no GIS-systems developed especially for this purpose.

The Ministry of the Environment has set a goal to develop united and unified GIS application for management of Protected Areas. Consequently, the Ministry appointed a programme (SALTI) to create the IT Systems for Protected Areas in 2008-2011. The responsibility to conduct the work was given to NHS.

Most important projects in the SALTI programme are the projects to

- develop a common database and GIS-system to manage the baseline information of all the PAs in Finland;
- enhance the contents and functionality of the Protected Area system with elements that support management planning and monitoring of PAs;
- develop common database and GIS-system to manage habitat data and support operational planning, documentation and monitoring of habitat restoration of PAs.

Visitor management systems ASTA and REISKA: The REISKA-GIS is a database of all infrastructure including trails managed by NHS. The information provided by REISKA is widely used to facilitate day-to-day management. In practice, the REISKA GIS data is used for maintaining, planning and up-to-date monitoring of the infrastructure. In addition, data is used by the PA staff to produce maps, leaflets and brochures, to

serve customers and to safeguard architectural and cultural heritage. REISKA-GIS is also directly used for channelling of visitors as it forms one layer of a map service (http://www.retkikartta.fi/?lang=en) provided for public.

In order to improve the reliability, accessibility and applicability of visitor information, a database system, ASTA, was developed during 2005–2006 for the management of this information. ASTA includes visitor survey data, numeric feedback data, and information on numbers of visits to protected areas, visitor centres under NHS. ASTA is also used to monitor and improve private–public partnership as it includes entrepreneur surveys and business partner feedback data.

From the ASTA and REISKA database applications, reports can be produced at area, regional or national level. The information obtained from the database applications is essential in monitoring the sustainability of outdoor recreation and nature tourism.

Transfer of technologies: Through transboundary cooperation the technologies and innovative approaches have been disseminated to other authorities responsible for management of PAs. For instance visitor management system ASTA has been modified to meet the requirements to manage the Estonian PAs.

OBSTACLES, NEEDS AND FUTURE PRIORITIES

In future NHS needs to focus in exploring the possibility to make the best and most innovative solutions developed in cooperation with many researchers and experts, more easily available for all partners working in the conservation field. One of the challenges for wider distribution is the lack of suitable or matching technical infrastructure that is needed in utilising the most advanced applications.

INFORMATION SOURCES

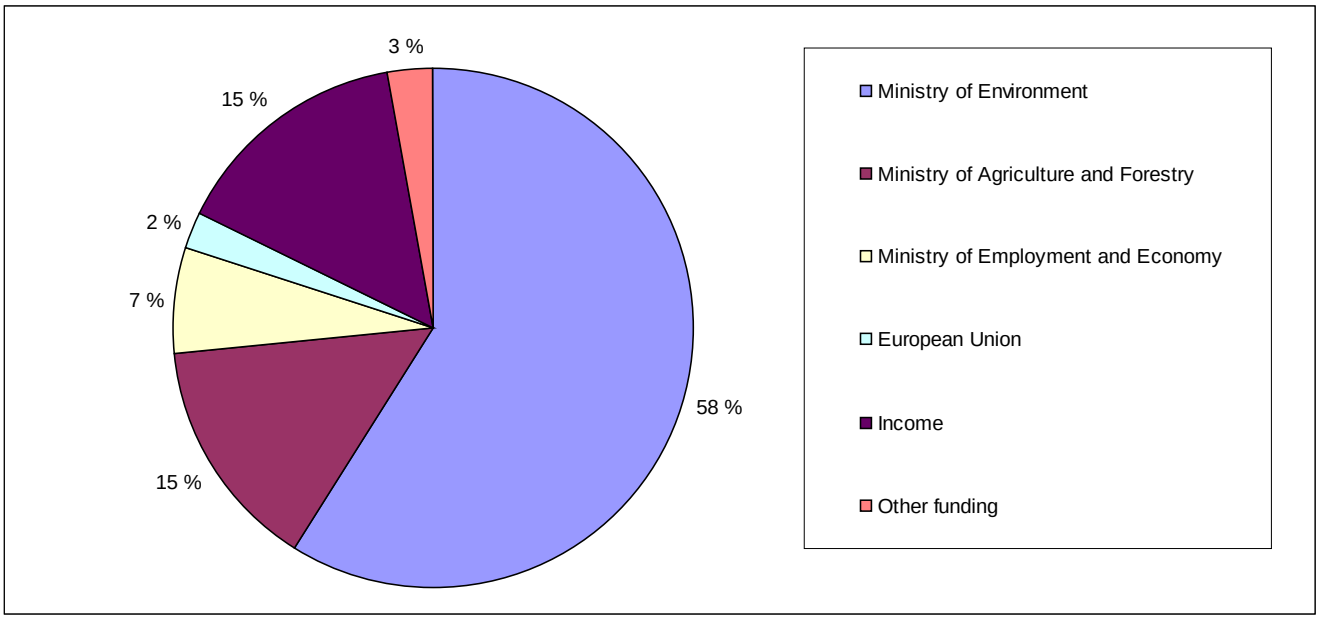
NHS-map service
http://www.retkikartta.fi/?lang=en

Goal 3.4: To ensure financial sustainability of protected areas, and national and regional systems of protected areas.

DESCRIPTION OF PROGRESS

NHS is fully accountable for effective and efficient management of national network of PAs. Annual reporting and hearings with relevant Ministries (Ministry of Environment and Ministry of Agriculture and Forestry) financing the work of NHS guarantees the transparency, efficiency and effectiveness of the work. System approach in PA management improves the security of the steady financial development of NHS work. The support the conservation work in developing countries and those with economies in transition via NHS international work has been implemented through capacity building projects financed mainly by EU funds. The satisfactory level basic funding for the management of PA system in Finland has been the major enabling factor for NHS staff to be able to conduct work over national borders.

Figure 8. *NHS 2008 Budged: Total: 51 882 000 €*



Increasingly the NHS works are implemented through projects with several partners and utilizing external funding sources. A project portfolio management system has been developed for improved efficiency and management skills. Project proposals are screened and implemented projects approved by the NHS management team.

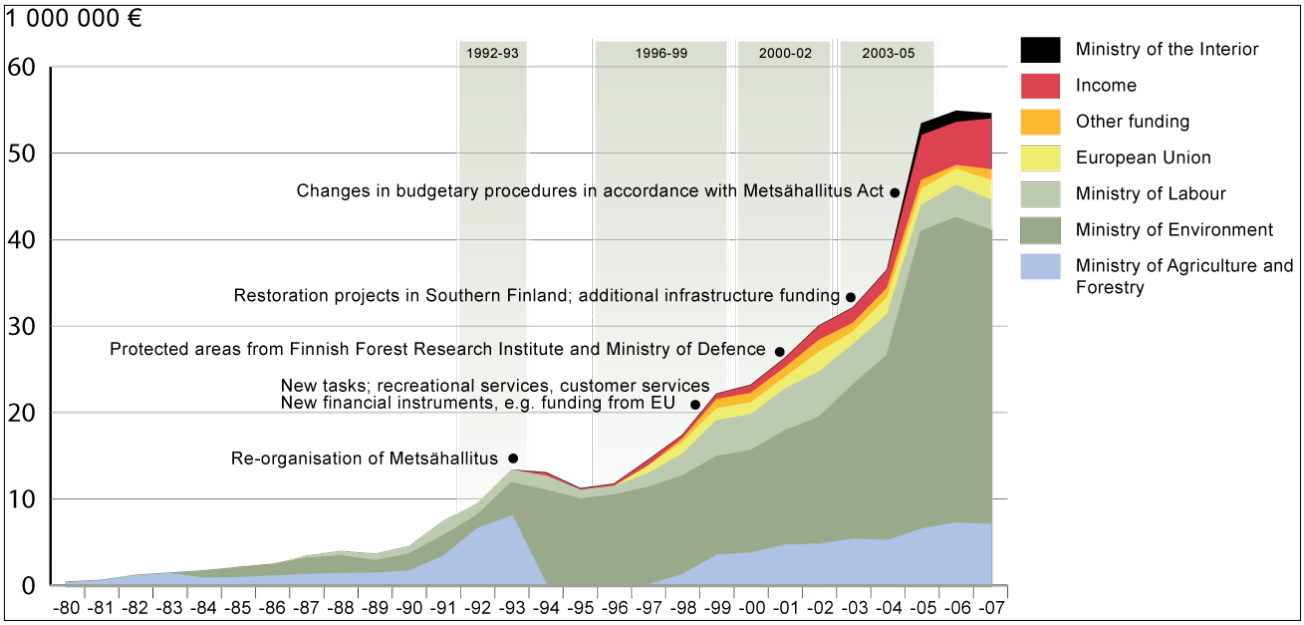


Figure 9. Funding of the Metsähallitus Natural Heritage Services 1980-2007*. Source: Metsähallitus.*

OBSTACLES, NEEDS AND FUTURE PRIORITIES

In current economic situation, it will be difficult to increase or even maintain the current levels of core funding for conservation from Government budget. External financing, especially from the EU programmes, but also from private sources will be required. In Finland, it has been especially difficult to utilize the rural development funding mechanisms for nature conservation, or to increase the conservation efforts by farmers.

INFORMATION SOURCES

State of the Parks in Finland report
www.metsa.fi/sop

Goal 3.5: To strengthen communication, education and public awareness.

DESCRIPTION OF PROGRESS:

NHS as a nationwide organisation has recently undergone a major organisational change where all the fields of work were evaluated and capacities needed were identified. One of the major challenges identified was the lack of strategic communications supporting the strategy and the goals of the NHS.
Despite the lack of a strategic approach to communications, a lot of PR, communications and environmental education activities have been taken place. Communications tools have been developed, visitor centres have put effort on the environmental education of both visitors and school classes alike, and media work has been active.

The media coverage on the NHS, National Parks or other PA's administrated by the NHS in 2008 was excellent resulting in over 3,000 media hits, and with a 9 % increase compared to the previous year. Only 46 articles were of negative nature.

Visitor centres national network: NHS has established and runs a comprehensive network of visitor centres, altogether 30 of them, located throughout the country mostly in the vicinity of most visited PAs. The principle objectives of the visitor centres are related to communication and awareness raising. The aim is to promote nature conservation, provide facility for environmental education and to give guidance and other services for visitors and hikers. In addition, the visitor centres have many other functions that vary from location to location. Cooperation with other biodiversity and culture related organizations and actors is common and exhibitions organised in cooperation with schools, museums, Saami museums (promoting Saami culture) etc. are good examples of dynamic collaboration. The number of registered visits in the visitor centres increased 2008 by 10 % to 859 000 visits. The number of people participating in guided tours decreased with 10 000 people from 2007, but the decrease was mainly due to improved statistical methods.

Web services: Outdoors.fi, Retkikartta.fi; Metsa.fi and Suurpedot.fi. The websites provided by the NHS on national parks and other hiking areas have been extremely popular. In 2008 the Outdoors.fi web service had over 2.1 million visits. The number of the users of the website grew with 19 %. Retkikartta.fi service, a web service with free downloadable maps for hikers and other useful information such as fishing sites, was opened in 2007, and already by the end of 2008 had had almost one million visits.
The NHS also produces information for the website of Metsähallitus, i.e. www.metsa.fi, which is designed mainly for stakeholder use. Two thirds of the contents are produced by the NHS, including reports and statistics on NPs and PAs and endangered species, land-use policies and plans, and media material.
Together with its partners, the NHS produces a website called suurpedot.fi, which is a website on large carnivores. The site is a joint project between Metsähallitus, the ministries of agriculture and environment, hunters' associations, and nature conservation organisations.

Environmental education. NHS maintains a web service for school- and preschool teachers containing information on materials, programmes and other special services provided for young people in PA visitor centres. Pages also include activity sheets and other material for teachers to be used in preparation of a visit. These pages are published as a part of outdoors.fi (Finnish and Swedish pages luontoon.fi and utinaturen.fi respectively). NHS also runs a great number of activities, programs and open house days for and with schools and day care units. Many NHS units cooperate continuously with their partner schools organising educational activities like studies and field trips.

INCORPORATION OF TARGETS INTO RELEVANT STRATEGIES, PLANS AND PROGRAMMES

The Communications Targets of the NHS are incorporated in, and streamlined with three strategies, whereof two are external and one internal: *The Communications Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006-2011* (lead taken by the Ministry of Environment); *The Principles on Communications on Natural Resources* by the Ministry of Forestry and Agriculture; and the strategy and action plan of Metsähallitus.

As part of the *Communications Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006-2011* the NHS will bear the main responsibility of organising training for journalists on biodiversity issues. This training programme will be carried out in autumn 2009.

OBSTACLES, NEEDS AND FUTURE PRIORITIES

A new systematic approach to communications was adopted at the end of 2007 when a decision was made to employ a communications manger and to reorganise the communications staff. This process is already well under way including the establishment of a core communications team taking responsibility for the communications strategy, and media, stakeholder and customer communications of the NHS. In addition, the operative communications staff will be reorganised in early autumn 2009, leading into streamlined working methods and capacity centres in various specific fields of communications.

The emphasis will be on **strategic communications** so that all communications activities form a holistic entity supporting the four main target areas of the Action Plan of the NHS. Firstly, efforts will be increased to communicate to customers and stakeholders about the importance of PA's in maintaining biodiversity and mitigating climate change. This will take place both in the field and visitor centres, through media communications and also through the websites of the NHS and other social media. Secondly, fact-based communications will be twinned with an approach appealing more to emotions in order to attract more visitors to National Parks and to help people to understand their value. Thirdly, specific communications strategies will be develop to enhance Destination Management and the cooperation between the NHS and the tourism sector, which is a prerequisite to provide high-class services for the visitors in NP's. Fourthly, internal communications will be strengthened and streamlined in order to support the coherence and strategic way of working of the NHS.

A project to strengthen **the brand of NHS** as the guardian of the NP's and other protected areas has already been launched. This work will be developed side by side with **the branding of National Parks**. Both are needed for instance to enhance the cooperation with the tourism sector and to increase the importance of NPs and other PAs in the minds of the decision makers and other stakeholders. The brand will also be strengthened by a uniform visual identity and tone of voice for the NHS, its communications materials and visitor centres.

Communications will also be an essential tool in creating a dialogue between local people and the NHS. Messages will be modified and communications channels chosen to match with the needs of the relevant stakeholder groups, such as landowners, entrepreneurs, decision makers, etc.

Lack of resources is always a challenge in communications. Hence, major emphasis will be put in joint communications projects with the partners of NHS. These can include joint stands in trade fairs, joint web sites or exchange of material for websites, joint media trips, and providing material on NP's for the publications of the partners. The Oudoors.fi site will be reconstructed, since web sites, although expensive to build, are cost-effective communications tools when in use. The new site will have a stronger visual identity, allow more freedom for each NP to highlight their events, and be easily usable also through mobile phones.

Another challenge is to measure the communications success. Simple monitoring methods, such as the number of media shots, are not adequate, since they do not indicate the effectiveness of communications.

INFORMATION SOURCES:

NHS web sites

www.outdoors.fi
www.retkikartta.fi
www.metsa.fi
www.suurpedot.fi

PROGRAMME ELEMENT 4: Standards, assessment, and monitoring

Goal 4.1: To develop and adopt minimum standards and best practices for national and regional protected area systems.

DESCRIPTION OF PROGRESS

NHS as responsible system level PA manager has well developed internal processes and networks for standardized manner working. The reorganising of the whole structure of NHS 2006 was a major milestone to support setting standards and for developing and conducting the dissemination of best practices throughout the organisation. PA management is divided to four fields of work (processes) to serve not only the internal practices but also to fully support the cooperation with stakeholders and other relevant sectors. The national steering units for key fields of work (processes) are mainly responsible for standardization of working methods and developing of appropriate guidelines as well as developing of IT-tools for managers. NHS international cooperation with all major partners within nature conservation community including e.g. IUCN, WWF, EUROPARC and national PA agencies worldwide, provide good grounds for peer reviewed standard setting at NHS.

Workbooks for customer services and for fieldwork (see 3.2.) are good examples on preparing guidelines in a participatory way integrating all the staff to the process. This approach secures that the results are to be taken into use even during the process. Business like working methods including service orientation has also guided the work resulting high level of customer satisfaction in recreational and educational activities.

NHS Strategy 2009. NHS has actively developed the core methodology for PA management and has contributed actively to international development. In the latest strategy (2009), the aim is to apply increasingly the adaptive management methodology of protected areas linked with "state of the protected areas" monitoring and reporting. This has increased both effectiveness and efficiency. Information systems are developed accordingly both for internal use and to serve visitors and the public. Major efforts have been made towards full coverage of habitat data and monitoring data for the key species as well as visitor monitoring. The organisation has been revised emphasizing the role of thematic expert units and strengthening the smaller number of regional units. The aim is to further increase national and local level involvement and empowerment of stakeholders in PA management.

Internal Environmental Programme. There is comprehensive environmental programme for all units at Metsähallitus-group. The web-based system for NHS describes the entire organisation and its goals, strategies, vision, mission and environmental policy, among other things. The procedure of responding to the environmental threats and feedback is also important element in the system. The system also guarantees that the environmental challenges are known by all staff members and internal audits guarantee the adequate level of awareness throughout the organisation.

The Principles of Protected Area Management in Finland; Guidelines on the Aims, Function and Management of State-owned Protected Areas. First published PA management principles date back to

1992 and were updated two times before 2007, when they were revised completely. The principles are applied in all statutory PAs and wilderness areas in Finland including Natura 2000 sites. In addition they may be used to a certain extent for management for instance in National Hiking Areas and Metsähallitus recreation forests. The principles include full description of the management regime including the legal basis as well as the internal norms and standards by NHS. The guidance is supporting the managers of PAs to conduct coherent hands-on management measures in standardized manner.

Science and ecosystem based criteria fully incorporated to all planning, monitoring and inventories.
Since 1995, NHS has incorporated up-dated research knowledge on restoration of habitats and management of vulnerable and threatened species by building up agreement-based collaboration with research institutes and universities. NHS experts have taken active part in the national surveys on threatened species and habitats and work permanently in the national expert groups for the conservation of fauna, flora and other taxa. NHS has invited species and habitat experts from other organisations to work in a number of NHS-lead projects and working groups, which synthesize their work into publications like guidebooks for planning, inventories, monitoring and management.

OBSTACLES, NEEDS AND FUTURE PRIORITIES

Applying global standards, best practices and criteria, e.g. IUCN protected area management categories, has proven to be challenging and in some cases even irrelevant for national priorities. However, within NHS, they are seen as imperative elements in developing national procedures in PA system level management. Thus the evaluation of he international PA management approaches and their appropriateness for NHS work, needs to continue and have a strong focus.

INFORMATION SOURCES

The Principles of Protected Area Management in Finland; Guidelines on the Aims, Function and Management of State-owned Protected Areas (2002, English, revised 2007, in Finnish only):
http://julkaisut.metsa.fi/julkaisut/pdf/luo/b054.pdf
http://julkaisut.metsa.fi/julkaisut/pdf/luo/b89.pdf

Goal 4.2 To evaluate and improve the effectiveness of protected area management.

DESCRIPTION OF PROGRESS

A system wide Management Effectiveness Evaluation and State of the Parks Assessment. In 2004, the Metsähallitus Natural Heritage Services carried out a limited site level self-assessment, and together with the Ministry of the Environment commissioned a system level international management effectiveness evaluation (MEE) following IUCN/WCPA designed framework. The evaluation covered the entire national network, but emphasis was on State administered areas (private-owned areas cover less than 5% of the system).
The evaluation report revealed that the level of Finland's protected area management is good, and with some exceptions, the targets set for the protection of biodiversity have been met. However, to improve the effectiveness of protected area management, the Evaluation Team presented some recommendations, of which a great deal are already incorporated and mainstreamed in national strategies and action plans on biodiversity, as well as the organization and everyday management practices of the NHS. One of the major outcomes following the MEE recommendations was the State of the Parks (SOP) in Finland report covering 2000-2005 and published in 2007. This in part revealed many needs for improvement of monitoring practice and information management.

Site-specific assessment of 70 areas, covering 80% of system surface area. As part of the MEE in Finland, the NHS assessed in 2004 altogether 34 national parks, 17 strict nature reserves, 12 wilderness reserves and 7 national hiking areas using the Rapid Assessment and Prioritization of Protected Areas Management (RAPPAM) methodology. These 70 sites cover some 80% of the surface of protected areas in Finland. The

assessment gave a good overview to the IUCN evaluation framework and of the status of management issues, especially to park staff.

Management Effectiveness tracking tool (METT). In Oulanka National Park also the Management Effectiveness Tracking Tool (METT) has been used, as part of the WWF and the World Bank survey (2004) including 206 forest protected areas, to evaluate status and management of the park 2004. Oulanka had the highest score of any protected area assessed, suggesting that at an international level Finland's protected areas are performing quite well (Dudley et al. 2004).

Lessons learned and communicated internationally. The experiences gathered by the NHS in Finland while collecting status and management effectiveness assessment information and drafting evaluation reports have been shared internationally in numerous ways. Results and methodology have been presented in EUROPARC annual meetings, IUCN World Conservation Congress in 2008 and many other forums. Finland's evaluation serves as one of the case studies in the IUCN Best Practice Protected Area Guidelines Series publication ("Evaluating Effectiveness", 2nd edition, Hockings et al. 2006).The NHS experience also greatly benefited the national MEE conducted in Lithuanian protected areas in 2006-2007 (Phare project "Institutional Strengthening and Modernization of State Protected Area Service").

International recognitions. In addition to MEE assessments, NHS work at the site level has been evaluated and certified by several international concepts like Europarc Charter (2 PAs), Europarc transboundary PA initiative "Following Nature's Design" (2 PAs), PAN Parks network (2 PAs) and European diplomas. These assessments have given the site level managers a lot of guidance on how to improve effectiveness of the work and as well provided the system level management useful information for strategic level work.

State of the Protected Areas (SOPA) monitoring system and reporting. See 1.4. Monitoring and assessment of protected area values.

OBSTACLES, NEEDS AND FUTURE PRIORITIES

The goal is aiming at establishing a framework for evaluation of the management effectiveness at all levels: site, system and transboundary. For Finland this may not be fully the right approach since NHS is the manager of the whole national (on state land) PA system and the system level evaluation is covering the most crucial potential shortcomings in the PA management. However, the RAPPAM and similar methodologies are rather easy to utilise but may not function as continuous evaluation measures. NHS is developing the SOPA (State of the Protected Areas) monitoring and reporting system to cover the whole network even in individual site level, when appropriate. This will be the future focus of NHS work to secure the efficient and effective management of the whole network.

INFORMATION SOURCES

MEE, www.metsa.fi/mee
SOP, www.metsa.fi/sop
Management Effectiveness tracking tool (METT)
http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2005/07/14/000160016_20050714165152/Rendered/PDF/32939a10ENGLIS1InProtectedAreasTool.pdf

Goal 4.3: To assess and monitor protected area status and trends.

DESCRIPTION OF PROGRESS

Protected area coverage routinely updated in national, regional and global databases. Information on State lands and waters has been administered by Metsähallitus, data on private-owned nature reserves has been collected by Regional Environment Centres. The Finnish Environment Institute has been responsible for annually collating the basic national protected area statistics and forwarding it to the European Environment Agency, which in turn forwards European PA statistics to UNEP to be updated in the global database WDPA. Data on Ramsar sites and Baltic Sea Protected Areas is updated by Metsähallitus and reported to the Convention Secretariats regularly. Official protected area coverage statistics are under the Ministry of the Environment (numbers and area of established and pending nature reserves and other protected areas, see 1.1.).

National indicators for percentage of protected main habitat types. The state and the development of biodiversity in Finland is presented by indicators, which are available publicly in the Internet (www.biodiversity.fi/en/, see also 1.1). Conservation status is estimated (as a preliminary percentage) for each main habitat type. Exact methodology and details for comprehensive habitat calculations outside the protected areas need still to be worked out. Overall average coverage for forests, mires, fells and inland/marine waters is growing, but there is a clear trend that most habitats in northern Finland are well protected and deficiencies exist for most in the south. Several assessments of PA network representativeness and coherence, which have been conducted in past decade, also supports this assumption. (See also 1.1 and 1.3).

Assessment of habitats and species conservation status. Comprehensive assessments of Finland's threatened species was published in 2000 (3rd national assessment) and of threatened habitats for the first time in 2008. The key findings are incorporated into the national biodiversity state indicators and available in the above mentioned public web service. Results indicate that for example that especially old forests host a great amount of threatened species and that traditional agricultural and habitats are in greatest danger to disappear. See also 1.1.

Conservation status of habitats and species of European importance listed in the EU Habitats Directive was assessed at regional level for 2001-2006 and reported in 2007. Directive species trends by habitat type are included as national biodiversity indicators (see 1.1. Indicators and trends). Thus far, the impact of conservation actions, including implementation and management of the Natura 2000 network, has not been comprehensively evaluated. The next implementation report is due in 2013 for the period 2007-2012 will include such an assessment.

INCORPORATION OF TARGETS INTO RELEVANT STRATEGIES, PLANS AND PROGRAMMES

Regular and systematic assessment of the state of parks and other protected areas are to be started in 2009. The assessment will be carried out in synchrony with management planning process. To ensure effective assessment, a new database of protected areas should be first developed and then utilized.

OBSTACLES, NEEDS AND FUTURE PRIORITIES

Reporting against many national and international level agreements and commitments is resource-demanding work. How to harmonise the interpretation of different set of indicators to support all reporting is a challenge. To find common grounds and to develop a system to overcome this challenge needs to be prioritized by NHS and other interests groups responsible of nature conservation and natural resources.

As explained above (see 1.4.), the NHS is presently working on establishing a **systematic monitoring and assessment scheme** at site level to follow how well the (nature) conservation values (and other values) of each site are maintained, and how the management planning and implementation of plans is supporting

and impacting the status. The method and procedure is still under development, but the idea is to monitor continuously and assess each site once every six years, taking into consideration the site-specific and over-all status of habitats and species. Assessments will cover over 1800 Natura sites, a total of over 5 million hectares equalling 15% of Finland's surface area.

The development of indicators (see 1.1. Indicators and trends) reflecting the development of various components of biological diversity as well as factors driving these developments is challenging and demanding task in regards to protected areas. These indicators, together with State of the Protected Areas monitoring, will become the backbone of the continuous assessment of the status and trends of the Finnish PA network.

A comprehensive information management system (SALTI programme, see 3.3) that will integrate most databases containing protected area data is currently under construction in Finland.

INFORMATION SOURCES

State of the Parks
www.metsa.fi/sop
www.biodiversity.fi/en/
Summary of the Evaluation of Threatened Species in Finland 2000
http://www.ymparisto.fi/default.asp?contentid=179629&lan=en
SY8/2008 Assessment of threatened habitat types in Finland (English summary)
http://www.ymparisto.fi/default.asp?contentid=283750&lan=en&clan=en
Habitats Directive 2001-2006 Member States reports
http://circa.europa.eu/Public/irc/env/monnat/library?l=/habitats_reporting/reporting_2001-2007/ms-reports_2001-2006&vm=detailed&sb=Title

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Goal 4.4: To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area systems.

DESCRIPTION OF PROGRESS:

NHS has numerous and wide cooperation mechanisms with science: The tendency is to increase and improve the cooperation between the research and PA management. This can be partly explained by the steadily growing number of recruited people with academic background. Currently NHS has over 20 permanent staff members with PhD degree. At the same time, NHS has driven policy of mutually beneficial research cooperation between NHS and research institutions. NHS has become a good partner for researchers providing them with facilities, baseline information and human resources to assist the work. NHS is naturally one of the end-users of the outcomes. The procedure for acquiring a research permission to work within protected areas has been simplified and unified throughout the country. Two main preconditions for the research permits are: 1) there will be no negative impacts to the biodiversity and other conservation objectives and 2) a concise result report is to be handed to NHS.

Scientific advisory board: In 2003, NHS invited a group of professors, directors, managers and researchers to form a Scientific Advisory Board (SAB) for four years (2003-2006) to support the NHS scientific work. SAB was asked to bring up topics and problems for interaction and networking between different sciences around NHS's activities. SAB's members represented a broad number of organisations and it held meetings both in office and in field twice a year. The second SAB was invited 2008 for another four year period.

Framework agreements with scientific institutions: NHS has scientific cooperation framework agreements with universities (Helsinki, Oulu, and Joensuu) and research institutes (Finnish Environment Institute, Finnish Forest Research Institute, Finnish Game and Fisheries Research Institute, Geological Research Centre, National Board of Antiquities) and research project agreements with many other universities.

NHS Strategy for scientific work: NHS scientific cooperation is based on its "Strategy for Scientific Work" created 2003. Since then, many new processes have started within the State research and administration structures. NHS will renew its Strategy for scientific cooperation in 2009 to confront the upcoming challenges.

Socio-Cultural-Economic research: In addition to biodiversity focused research there is also cooperation in the field of socio -economics and cultural research in relation to protected areas between the universities and research institutes (e.g. University of Oulu, Finnish Forest Research Institute) and NHS.