



SAVING NATURE FOR PEOPLE

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

COUNTDOWN

2010

SAVE BIODIVERSITY

SAVING NATURE FOR PEOPLE

NATIONAL STRATEGY
for the Conservation and Sustainable Use of
Biodiversity in Finland 2006–2016

NATIONAL ACTION PLAN
for the Conservation and Sustainable Use of
Biodiversity in Finland 2006–2016

A woman with short, layered brown hair and bangs is smiling warmly at the camera. She is wearing a vibrant purple blazer over a dark top and a pearl necklace. The background is a soft-focus outdoor setting with tall, thin grasses in the foreground and a blurred landscape in the distance. The lighting is bright and natural, suggesting a sunny day.

Foreword

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The Council of State approved the new National Strategy for the Conservation and Sustainable Use of Biodiversity in Finland 2006 – 2016 in its decision-in-principle of 21.12.2006. The significant reduction of the rate of biodiversity loss is a global target to which all parties to the United Nations Convention on Biological Diversity are committed. Finland has become the first EU member state to renew its national biodiversity strategy.

According to the Finnish Constitution, nature and biodiversity, the environment and Finland's national heritage are the responsibility of everyone. This responsibility is shared by the public authorities and private citizens and entities. The Council of State's decision-in-principle underlines the importance of cooperation within the administration, the sharing and bearing of responsibility, and open dialogues between the administration and private actors. The broadly based working group set up to monitor the implementation and effectiveness of the new strategy provides a vital forum in this respect. Dialogues involve communication, and the goal of improving communications related to the conservation and sustainable use of biodiversity is one crucial objective of the strategy and the action plan drawn up to promote its implementation.

Disturbances to natural systems are today often global in their extent, as can be seen in predictions of the impacts of climate change. This is also true for trends in biodiversity. Declining biodiversity endangers the well-being of the environment and people, and affects the prospects for the livelihoods of future generations on a global scale. Such problems have to be tackled wherever they are created. This makes all states responsible for the actions needed within their own territories. Each country must

also share responsibility for the necessary international cooperation. The new National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity represent Finland's vision of the necessary measures. The strategy stresses Finland's continued commitment to strive for the conservation of biodiversity together with the international community.

It is crucial to have a robust scientific knowledge base to ensure that the measures taken to protect nature are wellplanned and cost-effective. There is also a need for research findings from the social sciences on human behaviour, economic mechanisms and the impacts of different measures on people as well as nature. Close collaboration between the scientific community and policy-makers is also vital.

Biodiversity is not merely a theoretical concept, but an essential part of our everyday lives, our well-being and the basis for our livelihoods. Nature and its material and spiritual benefits are particularly close to Finns. It is all too easy to take the fruits of biodiversity for granted and remain unaware that nature is faced by serious threats – and that we are all in a position to make choices that affect the natural environment. Nature and nature conservation are important values that also have pronounced cultural dimensions in Finland. By cherishing biodiversity we are also defending the rights of people to their future livelihoods and safeguarding the prerequisites for the survival of life on earth on a wider scale.

Paula Lehtomäki
Finnish Minister of the Environment

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Introduction

International background

The United Nations Convention on Biological Diversity (CBD) was signed twelve years ago, but human activities are still accelerating the decline of the world's species, habitats and genetic resources. According to experts, some 16,000 animal species and 60,000 plant species are under threat. A research project supported by the UN General Secretary and funded by the World Bank showed in 2005 that ecosystems vital to about 60% of the world's human population have been impoverished or are being unsustainably exploited due to population growth and economic expansion. This trend can only be reversed if the Parties to the CBD work more effectively to promote the conservation, management and sustainable use of biodiversity. The international community is committed to significantly reducing the current rate of loss of biodiversity by 2010. The European Union has also resolved to halt the loss of biodiversity by 2010.

The economic exploitation of natural environments is globally the most significant factor behind the impoverishment of biodiversity. Every year about two per cent of the world's original natural habitats are converted into farmland, commercially managed forests or built-up areas. This trend has led to the shrinking and fragmentation of natural environments, and widespread extinctions of the species and populations dependent on them, in both industrialised and developing countries. Other specific threats to biodiversity include climate change, harmful invasive alien species, the excessive exploitation of natural resources, and pollution. Harmful environmental changes often only become evident after a certain time lag. Partly because of this, the ongoing impoverishment of the natural environment has not yet been given sufficient attention, even though this is a truly global phenomenon.

The weakening of ecological communities can lead to the serious disruption of the vital ecosystem services that

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they provide for humans, such as clean water, functioning water cycles, carbon sequestration, pollination and the recycling of nutrients. The capacities of ecosystems can to some extent be restored, for instance through reforestation, but forest plantations cannot compensate for the loss of natural levels of forest biodiversity. Little research data is yet available on the linkages between biodiversity and ecosystem services, but changes in the natural environment are proceeding alarmingly rapidly.

The deterioration of the natural environment in developing countries, as exemplified in the worrying shrinkage of the world's tropical rainforests, is often a consequence of social problems such as poverty and uncontrolled population growth, with natural habitats consequently having to be converted to agricultural land to increase food production. Environmental deterioration can also be the result of poorly planned socioeconomic incentives such as misdirected subsidies. Agricultural subsidies, for instance, may have promoted shortterm farming practices that lead to the loss of natural forests, the destruction of farmland, and the decline of natural sources of nutrition. The consequent problems can particularly affect people in poorer countries.

In the industrialised countries, efforts are being made to slow the ongoing loss of biodiversity through various measures at different levels. In land use planning, for example, valuable habitats are surveyed and protected to prevent their fragmentation. The key species and species groups within ecosystems are defined, and steps are taken to ensure their populations remain viable in the long term. Land use legislation is also defined with regard to the needs of species and species groups. Key ecological, social and economic factors are assessed through partici-

patory planning processes. Economic incentives and fiscal policies are being redesigned to give higher priority to the conservation of biodiversity.

The task of conserving and maintaining biodiversity must involve measures taken by business sectors, private firms and citizens, as well as national and local authorities. The functioning of natural ecosystems cannot be maintained merely by strictly protecting certain species or habitats. Innovative and comprehensive land use planning methods are needed to alleviate the harmful impacts of socioeconomic activities on the natural environment, while also safeguarding the livelihoods of people dependent on natural resources.

The main objectives of the CBD 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. Through decisions adopted by the Conference of the Parties, a system has been built for facilitating the implementation of these commitments and the monitoring of progress. The core of this system is formed by the Strategic Plan (COP Decision VI/26) and the thematic and crosscutting work programmes and related strategic guidelines and plans.

The Parties to the CBD have committed themselves to implement the Convention's three main objectives more effectively. COPs have approved seven thematic programmes of work on marine and coastal biodiversity, agricultural biodiversity, forest biodiversity, the biodiversity of dry and subhumid lands, the biodiversity of inland waters, mountain biodiversity and island biodiversity. Each of these thematic programmes defines a vision, basic guiding principles, the most important issues to be addressed,

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expected results, and a schedule. The implementation of these programmes involves, in addition to the Parties to the CBD, the Convention Secretariat and other relevant organisations around the world. The thematic programmes of work will be periodically revised at COPs.

The COPs have also often addressed issues that run across many of these thematic areas. Such cross-cutting issues include sustainable use, biosafety, access to genetic resources and the sharing of the related benefits, the traditional knowledge and practices of indigenous peoples, patent issues, indicators, taxonomy, communications, education and public awareness, incentives, and invasive alien species. Many of these issues, such as the development of indicators, also directly support the implementation of the thematic programmes of work. Separate documents have been drafted on other issues, including a programme of work on protected areas, the Biosafety Protocol, and voluntary guidelines concerning invasive alien species.

Summaries of thematic and cross-cutting programmes of work as well as guidelines and principles on issues of significance to Finland are presented in tables at the beginning of the relevant sections of the National Action Plan. The sustainable use of biodiversity is one of the CBD's three main objectives, and the related 'Addis Ababa Principles' are also presented here in Annex I.

The Strategic Plan of the CBD has four main goals, each of which is linked to several objectives designed to promote the implementation of the Convention. To monitor progress towards these objectives and the Plan's 2010-target, a global monitoring framework was approved by COP7 in Kuala Lumpur in 2004 (Decision VII/30), covering seven focal areas for action:

- (a)** Reducing the rate of loss of the components of biodiversity
- (b)** Promoting the sustainable use of biodiversity
- (c)** Addressing the major threats to biodiversity (including threats arising from invasive alien species, climate change, pollution, and habitat change)
- (d)** Maintaining the provision of goods and services obtained from biodiversity to support of human well-being
- (e)** Protecting traditional knowledge, innovations and practices
- (f)** Ensuring the fair and equitable sharing of benefits arising out of the use of genetic resources
- (g)** Ensuring the provision of adequate resources (mobilizing financial and technical resources to help implement the CBD in developing countries, particularly in the least developed countries, small island states as well as countries with economies in transition)

The objectives and targets defined for the global monitoring framework should be seen according to the COP decision as a flexible framework, within which national and regional objectives can be defined. Parties to the CBD are obliged to devise their own national targets and objectives, and incorporate them as necessary into the relevant plans, programmes and initiatives, including national biodiversity strategies and action plans. The seven focal areas of the global monitoring framework include 11 specific goals and 21 global targets, as well as many indicators. These goals and targets have been designed to complement the existing objectives defined in the Strategic Plan.

The 8th Conference of Parties to the CBD (COP8, Curitiba, 2006) resolved that the goals and targets with-

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in the framework should remain in force until 2010, after which they will be reassessed in connection with the revision of the Convention's Strategic Plan.

The global monitoring framework for the 2010 target and its focal areas, goals, targets and indicators are presented in Annex II.

The National Action Plan for Biodiversity in Finland 1997-2005

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. The Action Plan was also designed to complement the Finnish Government's Sustainable Development Programme (1998) with regard to the conservation, management, and sustainable use of biodiversity.

The implementation of the Action Plan was monitored by a broadly based monitoring group, who have also been responsible for the revision of the Plan in response to new-

ly perceived needs, the latest research results, and other national and international developments. Progress reports have been duly submitted to the CBD Secretariat. In the first progress report the monitoring group examined the implementation of the Action Plan during the period 1997-1999, identifying 12 important areas for development. A second progress report was compiled focussing on actions taken in these areas during the period 2000-2001. The third progress report continued to assess the implementation of the National Action Plan during the years 2002-2004. These progress reports are in effect assessments made by Finland's ministries and other stakeholder groups of the effectiveness of their own actions.

As a party to the CBD, Finland is committed to promote the conservation and sustainable use of biodiversity in activities in all sectors of society (Article 6 of the CBD). By the time the National Action Plan for Biodiversity in Finland 1997-2005 began to be implemented, thanks to renewed legislation and other factors, a good basis had been established for the Action Plan itself, for decision-making and other developments related to biodiversity, and for co-operation between the administrative sectors concerned and other stakeholder groups. Biodiversity considerations had 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 and the Water Act.

Sectoral responsibility for the conservation, management and sustainable use of biodiversity as specified in the National Action Plan has been duly adopted by the various branches of the administration. Stakeholder groups

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are also committed to maintain biodiversity. In particular, the Ministries of Agriculture and Forestry, the Environment, Transport and Communications, Defence, and Education have developed their activities and planning procedures, and provided training for personnel working within their administrative spheres on issues related to biodiversity.

In spite of many positive developments, it has become evident that the measures within the National Action Plan will not be sufficient to halt or even significantly slow the ongoing decline in biodiversity in Finland by 2010. It seems to be very hard to reverse this trend rapidly. Many of the negative trends affecting biodiversity, for instance in Finland's forests, have emerged over long periods, while earlier practices may still result in delayed impacts on biodiversity, even though forestry methods have changed significantly in recent decades. Meanwhile, changes in forestry and the spread of residential areas in recent decades have resulted in new trends that impoverish the natural environment. Climate change is also now seen as a major threat to nature as well as mankind.

The most significant challenges noted at the conclusion of the programme period of the National Action Plan at the end of 2005 were as follows:

- the wideranging nature of the Action Plan
- the lack of a comprehensive research-based overview of the state of biodiversity and the impacts of the Action Plan
- the practical implementation of sectoral responsibility
- the need to identify new approaches and economic mechanisms that will help to safeguard biodiversity

- the need to make the contents and objectives of policies designed to safeguard biodiversity more widely understandable
- the need to disseminate information about biodiversity so as to facilitate regional and local decision-making

An evaluation of the National Action Plan for Biodiversity in Finland 1997-2005 conducted during the years 2004-2005 provided a wealth of additional information on the current state of and trends in biodiversity in Finland, as well as the impacts of the practices and measures so far adopted. This evaluation showed that the need to safeguard biodiversity is widely understood in Finnish society. However, the measures within the Action Plan have still not been sufficient overall to halt or reverse the ongoing negative trend in biodiversity in Finland.



Special Features of the Natural Environment in Finland, and the Current State of Biodiversity

Special features of the natural environment in Finland

Bedrock

The bedrock beneath Finland forms part of the ancient Fennoscandian Shield, which also includes the whole of the Scandinavian Peninsula, Russian Karelia and the Kola Peninsula. Outcrops of very old PreCambrian bedrock occur across these regions. But Finland's surficial deposits are in geological terms very recent, having been mainly laid less than 13,000 years ago, and in places just a few thousand years ago. Finland's geology thus features the rare collocation of rocks and landforms dating from the most recent and the most ancient geological periods. When the continental ice sheet receded from Finland at the end of the last ice age it left behind moraine ridges

and extensive glaciofluvial eskers and deltaic formations. The land pressed down by the weight of the ice on the Earth's crust is still rising today, resulting in the emergence of new land from the sea, and maintaining the ongoing processes of ecological succession along Finland's coasts.

Climate

Finland's climate is exceptionally mild considering its location in the boreal coniferous forest zone. The warming effect of air masses from the Atlantic Ocean means that Finland's annual average temperatures are about six degrees higher than the averages across the boreal zone. The combination of thermal and light conditions and characteristic periodic temperature variations of the Finnish climate are unlike those occurring elsewhere in the

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boreal coniferous forest zone. Average temperatures for the warmest month (of some 13-17 degrees) are similar to those in England, for instance. Groundfrosts are relatively shallow and shortlived, due to Finland's relatively mild winters with plentiful precipitation and considerable snow cover. Extensive forests grow hundreds of kilometres north of the Arctic Circle across Fennoscandia. Elsewhere in the world such forests can only be found north of the Arctic Circle in a few parts of Siberia and Alaska. In southern coastal regions of Finland, oak trees and other more southerly species thrive in diverse hemiboreal woodlands that lie on the same latitudes as the southern tip of Greenland.

Vegetation zones and landforms

Finland's characteristic climatic features are compounded by the country's lowlying relief. This is reflected in the extent of the southern boreal forest and mire vegetation zone across the Finnish Lake District, and in the exceptionally wide central boreal zone across Ostrobothnia. The Northern Ostrobothnian section of the northern boreal zone is also exceptional. The northern boreal taiga zone of Eastern Fennoscandia is mainly dominated by the typical forest and mire vegetation of Southern Lapland. One unusual feature in this zone is that in Finnish Lapland Scots pine grows further north than Norway spruce. The mountain birch belt found bordering the open fells of Northern Lapland is another feature not found further east, where in comparable areas Siberian spruces and larches form tundra forests. The forests along the emergent coasts of the Gulf of Bothnia are very young in terms

of the evolution of their ecosystems, while in parts of Eastern Finland similar forests have grown in the same areas for more than a hundred tree generations.

Inland waters and the Baltic Sea

Finland's lakes are characteristically shallow and broken up by many islands and peninsulas. It has been calculated that Finland's lakeshores have a total length of some 130,000 km. Smaller waters, bird wetlands and lakes with plenty of aquatic vegetation are particularly associated with high levels of biodiversity. Many areas along Finland's Baltic coasts similarly feature diverse and labyrinthine archipelagoes, formed due to the fragmented nature of the bedrock. Since the last ice age the Baltic Sea has gone through various freshwater and brackish water phases. Due to its northerly location, seasonal variations in light conditions and surface temperatures in the Baltic Sea are great. Other unusual physical features of the Baltic Sea also affect its ecological characteristics and species diversity. There are no tidal shores around the Baltic, and no extensive deep waters, so species characteristic of such habitats are absent. The most significant special feature of the Baltic Sea is its low salinity. Salinity levels and water temperatures are the most significant factors limiting the distribution of aquatic species in the Baltic. The mixed nature of the Baltic's ecosystems, which contain both freshwater species and typical marine species, make it a unique marine environment in ecological terms.

Routes used by species to spread into Finland

Finland is only connected to the main Eurasian landmass by a relatively narrow isthmus to the east and southeast. Since the ice age various natural barriers have limited the spread of species into Finland, and in many ways affected the processes of establishment and adaptation to local conditions. River valleys, interlinked lakes, marginal moraine ridges and eskers have all served as routes for aquatic or terrestrial species to spread along at different stages. In some cases this is reflected in the outlying occurrences of certain species far away from their current core distributions. In many cases species' local populations have become differentiated, due to the large distances between populations, or other barriers effectively separating them. Distinct subspecies or races can be distinguished for many widely distributed species. Finland is home to several taiga species that do not occur anywhere else in Western Europe.

Conditions in rocky habitats and on esker slopes are more extreme than those in flatter, lowerlying areas in the coniferous forest belt. Species that do not thrive in other habitats may be found in rocky habitats and on eskers. After the ice age the ridges of eskers constituted vital migration routes for terrestrial species. Higher ridges and rocky hilltops have been free of ice and water much longer than lowerlying areas. The plant and insect communities found on eskers are distinctive, especially on sunlit slopes. The characteristic plants found on eskers include species with varying origins and historic distributions. Some species first spread into Finland from the east and northeast, but many others spread from the steppes of Eastern Europe.

The insects found on Finland's eskers may also largely have originated from these steppes, since their core distributions today still lie faraway from Finland to the east and south.

Species

The species mix found in Fennoscandia includes southern, northern and eastern elements. Most are European species, whose isolated distributions during the ice age were located in Europe or on its fringes. European species can generally be characterised by their relatively broad and flexible habitat requirements. Only a few of the species found in Finland's forests and Arctic fells are truly northern species.

Humans first settled Finland already during the ice age, and have subsequently shaped the natural environment in very many ways. From the point of view of biodiversity in Finland today, the most significant impacts are related to agriculture. Farming was for centuries based on shifting 'slash and burn' cultivation and the extensive use of meadowlands. Finland's native species today include many species associated with such man-made habitats. These species may either have been deliberately brought here, or spread long ago and subsequently found suitable habitats in environments shaped by agricultural practices. Hunting, fishing, slash and burn farming and tarburning all increased the occurrence of forest fires, at least in the south. Species dependent on forest fires were radically affected when people started to see timber more as a valuable raw material in itself rather than depending on activities that involved burning trees. It can be said that during

prehistoric and historic times human settlement in Finland generally served to increase biodiversity. Only since the age of industrialisation have socioeconomic changes led to changes in the natural environment that threaten both Finland's original natural biodiversity, and the biodiversity that subsequently arose due to human activities such as traditional farming.

The current state of biodiversity

Current state

Our increasingly intensive use of land and natural resources has reduced our ability to maintain biodiversity in Finland at the levels it has historically reached. Ever more extensive areas are being shaped by human activity. Natural habitats in Finland have changed and are still changing both quantitatively and qualitatively in ways that affect the state of biodiversity and its trends. More uniform land use practices have meanwhile reduced both the diversity of habitats and their natural smallscale variations.

Dramatic environmental changes have occurred in farmland habitats and in other areas shaped by man, as well as in natural habitats, in particular in forests and along shores. Changes in the state of such habitats and ongoing trends have led to a reduction in their species diversity, and represent an increasing threat to demanding or specialist species. In the planning and use of river systems and their natural resources, not enough weight has yet been given to ecological considerations such as the need to safeguard native fish stocks, and the effects

of manmade habitat changes on other species.

The trends described above have favoured species that are adaptable and able to spread into new areas and thrive in habitats shaped by man. At the same time, however, there has been a general decline in species associated with biotopes created by traditional farming practices. Future trends in biodiversity can go on being shaped by the harmful effects of human activities a long time after these changes occur.

The increasing threat to species diversity is particularly highlighted in smallscale speciesrich habitats such as sandy seashores, coastal meadows, dry meadows, wooded pastures and meadows, oldgrowth herb-rich forests, speciesrich derelict lands, esker forests, calcium-rich rocky habitats, small water features and fens.

In the near future the threat to well know species groups is expected to increase slowly. The proportion of all species classified as threatened may by 2010 be around 1% higher than it was in 2000, when the last major assessment was compiled. There are significant differences between the trends for different species groups, however. The numbers of threatened species are expected to rise most steeply for certain insect groups and for species associated with cultural environments. At the same time more alien species are likely to spread into Finland, both naturally and due to human activities, and some of these newcomers may have harmful impacts on native species.

Current trends

Many measures implemented recently, especially in forests and farmland, have helped to safeguard biodiversity. Many of these measures have involved legislative changes, such as the protection of biotopes under the Nature Conservation Act, and the specification of particularly important forest habitats in the Forest Act and aquatic biotopes in the Water Act, as well as the establishment of Finland's Natura 2000 network and the sustainable forestry support scheme. Other important measures have included new forestry guidelines applied in commercially managed forests, Metsähallitus's natural resource planning procedures and habitat restoration work in protected areas, and agrienvironmental subsidy schemes.

There have also been clear longterm shifts in the direction of activities and in attitudes. New drainage schemes are no longer included in forestry plans and support schemes; landowners' opinions are given more weight in the context of efforts to safeguard biodiversity; and new ways to preserve biodiversity have been developed, notably within the METSO Forest Biodiversity Programme for Southern Finland.

The levels of expertise on biodiversity and landscape level planning required in land use planning, as well as adaptive natural resource management practices, have not yet been sufficiently developed to guarantee for example the preservation of extensive ecologically coherent natural areas and networks, however.

Measures taken to increase biodiversity, such as deliberately increasing the amounts of decaying wood, are generally cumulative, and slow to take effect, so positive impacts do not become evident immediately. Increasing

the quantities of decaying wood in commercially managed forests will nevertheless improve the longer-term prospects for species dependent on decaying wood. So far it seems that enough decaying wood for the most demanding species can only be created in protected areas.

The objectives and principles adopted to help preserve biodiversity have widely become the focus of public debate. Thanks to increased research, much more data is now available on biodiversity in Finland, enabling the establishment of a more detailed and more applicable knowledge base. This in turn provides a basis for purposefully planned changes in activities, for more applied research, and for increasing awareness and recognition of the value of biodiversity to society.

The importance of the communication and dissemination of information on biodiversity has been greatly emphasised recently. But for economic or social reasons, relatively little prominence has so far been given to biodiversity in fields such as construction, forestry and agriculture. Progress has also been hindered by a lack of research data, training and information that could facilitate the practical consideration of biodiversity issues in cooperation with landowners and other key actors.



Government Decision-in-Principle

on the National Strategy for the Conservation and Sustainable Use of Biodiversity in Finland 2006-2016; Saving nature for people

On 21st December 2006 the Finnish Government made the following 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. In terms of public finance, it is intended that the strategy should be implemented within existing budget frameworks, without any separate or additional specific financing.

Introduction

Finland is committed to the main objectives of the UN 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. 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. The CBD's 2010 target and the related global provisional framework for goals and targets effectively combine the thematic and cross-cutting programmes of work approved at Conferences of Parties (COPs) and complementary guidelines and principles. The objectives and targets approved for the global provisional framework for goals and targets at COP 7 form a flexible framework for national and regional targets.

The EU Commission's Communication of 22.5.2006 "Halting the loss of biodiversity by 2010 – and beyond" (COM (2006) 216 final) complements the EU's Biodiversity Strategy and Action Plans, also serving as a report on their implementation for the European Council and Parliament. The communication briefly reviews the state of biodiversity globally and within the EU, and also analyses current trends and their causes. It also outlines the EU's objectives for four key biodiversity policy areas, and defines ten general objectives. An Action Plan set out in

an annex to the communication sets more detailed targets in relation to these policy areas and objectives, as well as 158 actions to be carried out within the Community, largely by the Commission and Member States. The Commission also proposes that corresponding measures should also be carried out in the overseas territories of Member States where the habitats and bird directives are not enforced. The main aim of the Communication and its Action Plan is to integrate the conservation of biodiversity into other Community policies. During the Finnish EU Presidency in the second half of 2006 Finland was responsible for the preparation of the EU Environment Council's conclusions on the Communication. The basic outlines of the Commission's Communication have been considered during the preparation of Finland's national strategy.

The National Strategy for the Conservation and Sustainable Use of Biodiversity in Finland 2006-2016 is based on the main issues set out in the CBD. The strategy aims to ensure the ecologically, economically and socially sustainable use and development of Finland's biodiversity and natural resources. This will safeguard favourable environmental conditions for people and the future prospects for livelihoods based on the use of natural resources, as well as the conservation of biodiversity. To achieve sustainable development, production and consumption patterns with harmful impacts on biodiversity must be changed. The Finnish Government's decision-in-principle of 14.12.2006 "Towards sustainable choices – a nationally and globally sustainable Finland" thus also forms an important general framework for the conservation and sustainable use of biodiversity.

Finland's vision and strategic goals

Vision:

The decline in biodiversity in Finland has been halted. Stable conditions are maintained in the long term. Biodiversity is protected and sustainably used in Finland both for the sake of its own irreplaceable conservation values, and as a source of human wellbeing.

The strategic goals of the national strategy and action plan for the conservation and sustainable use of biodiversity in Finland 2006 – 2016 are:

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

Key challenges

Forests

Efforts to preserve forest diversity have been intensified recently, through increases in the areas of forest under protection, improvements in the quality of protected forests achieved through habitat restoration schemes, and the development of natural forest management practices for commercially managed forests. But in spite of these positive developments, forest species are still increasingly threatened in Finland, partly because protective measures are often slow to take full effect. Expert evaluations suggest that without further measures the numbers of forest species becoming threatened or extinct in Finland will go on rising in the near future. Further measures are particularly needed to safeguard forest biodiversity in Southern Finland. With regard to the structural features of natural forests, it is particularly important for the sake of biodiversity to increase the amounts of decaying wood in the forests.

Mires

In the context of mire protection in Finland, there are still regional deficiencies and deficiencies concerning certain types of mires. In some regions very few mires are protected. The situation regarding the protection of spruce mires and fens is particularly unsatisfactory in Southern Finland. The ecological functioning of protected mires may be endangered due to drainage schemes where there are no buffer zones to safeguard their natural hydro-

logical balance. In future more attention must be paid to ongoing changes occurring in the vegetation of protected mires for reasons as yet not fully understood.

Farmland habitats

Traditional forms of livestock farming enriched the diversity of farmlands by creating many different open and semi-open habitats, today referred to as traditional agricultural biotopes. Following the end of the traditional farming of meadows and pastures, such habitats have no longer been economically used or maintained. The numbers of livestock farms and grazing animals have declined rapidly in recent times, especially in Southern Finland. Farmland is used more intensively, leading to a decline in the habitats of many farmland species. The numbers of farmland species under threat have been clearly increasing. A national inventory of heritage landscapes conducted about a decade ago listed some 3,700 valuable heritage landscapes, of which only about half are currently maintained. The need to improve the protection and management of biodiversity in farmland habitats is one of the greatest challenges for the near future in the context of safeguarding biodiversity in Finland. The importance of such habitats is compounded by their high landscape and cultural values. The suitable management of artificial open areas such as grassy road verges, which are widespread across Finland, could compensate to some extent for the loss of traditional farmland habitats.

Wetlands

The sites within Finland's bird wetlands conservation programme represent a wide range of lakes, nutrientrich sea bays, shallow seashores and deltas. Most of these sites urgently require some form of habitat restoration, particularly where more open areas and waters are becoming overgrown due to various factors. In many areas open waters, flood meadows and shore meadows vital for many birds and plants are gradually becoming more uniform reed beds and scrub.

Inland waters

Measures to reduce nutrient loads are vital in terms of protecting the biodiversity of aquatic habitats. But the harmful impacts of nutrient loads from diffuse sources can only be reduced slowly. The water quality in most of Finland's rivers is today only at best satisfactory, largely due to high nutrient loads from diffuse sources. In many rivers structures such as dams and weirs and high loads of nutrients and particles represent the most significant threats to the habitats of declining and threatened migratory fish populations. The restoration of natural waterways and the preservation of natural hydrological conditions are vital for aquatic species diversity. Very few smaller inland waters remain in their natural state. Too little attention has so far been given to the need to protect and maintain natural streams, which perform a vital role in the removal of excess nutrients and particles, in evening out flow rates, and in safeguarding biodiversity. Climate change can be expected to affect hydrological conditions such as water levels, flood regimes and the loads present in lakes and

rivers due to increases in natural leaching and water temperatures. These changes are likely to have negative impacts on aquatic biodiversity.

The Baltic Sea

The greatest threat to biodiversity in the Finnish waters of the Baltic is eutrophication. Economic activities such as gravel extraction are becoming more widespread. The ecological impacts of such schemes can be hard to predict or relate to local levels of biodiversity, due to a lack of information. Finland's Natura 2000 network includes sites of importance for their coastal and marine areas biotopes and species, but there is still a need to assess how the network would need to be extended in more open marine waters. Plans for the use and management of existing marine protected areas have not yet been completed or implemented. For these plans to be effectively implemented, more research data will be needed on marine ecosystems. Measures to combat the spread of harmful invasive species are another key challenge related to biodiversity in the Baltic Sea.

Shores

Shore habitats are estimated to make up some 2% of Finland's total land area. Shores have a special significance for biodiversity as the zones where terrestrial and aquatic habitats come into contact. Shore habitats and species are particularly threatened by construction, eutrophication, the effects of changes in farming practices on vegetation, and recreational activities in some areas. Impor-

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tant spawning areas for fish have not been given enough consideration in shoreline developments. The numbers of shore species under threat have risen. More attention must particularly be given in future to managing and protecting the biodiversity of emergent coastal habitats, sandy seashores and shore meadows. Regularly flooded habitats are also important for their biodiversity.

Open arctic fells

Most of Finland's open arctic fells are already under some form of protection. These habitats are affected to varying extents by reindeer herding, other traditional livelihoods, tourism and other recreational land use. Reindeer herding has evident harmful impacts in some areas. In some localities mining operations, road construction and tourism developments have had negative impacts on biodiversity. But the greatest future threat to arctic fell ecosystems is global warming, since adapting to climatic changes will be a challenge both in nature conservation terms, and for the region's traditional livelihoods. This aspect of climate change will particularly affect the cultures of the indigenous Sámi, since most of Finland's open arctic fells lie within the Sámi homeland region.

Rocks and soils from a biodiversity perspective

Although the CBD does not directly address the protection of geological diversity, the dependence of ecosystems on the characteristics of rocks and soils means that they have an essential role in the conservation of biodiver-

sity. The importance of protecting soils in the same way as air and water is increasingly being recognized, and the EU is currently preparing a soil protection strategy. Not enough is known about the biodiversity of farmland and forest soils.

Finland's Land Extraction Act aims to ensure that materials are extracted so as to support environmentally sustainable development. For the related permit system to operate effectively, however, more information is needed about the natural values of rock formations and landforms. Finland's current mining legislation has become obsolete, and does not give any consideration to biodiversity in its controls over mineral prospecting and mining activities. The current rapid increase in mining activity in Finland may give rise to conflicts with regard to the need to protect biodiversity.

Other habitats valuable for biodiversity

Urban environments include many cultural biotopes with rich species diversity. Many threatened species also find suitable habitats in built-up areas. In urban areas nature is accessible to many people, providing valuable opportunities for recreation. Cities' green areas, protected areas and even derelict land can also be of great value for nature studies and environmental education. But the special features of urban ecosystems and the threats they face have not yet been sufficiently studied or publicised. Naturally open habitats, including many habitats affected by intense sunlight, have been rapidly disappearing, and not enough is known about valuable remaining examples.

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Certain man-made habitats such as road verges and the open strips of land beneath power lines can to some extent compensate for the loss of such naturally open habitats.

Species protection

Finland's third national Red List survey, published in 2000, classified a total of 1,505 species as threatened. The lists of threatened species annexed to the Nature Conservation Decree were consequently amended to include 1,393 species, of which 592 are described as being in need of special protection. Intensified efforts to protect these species or other threatened species have in many cases already borne fruit, and other actions may also benefit threatened species after a certain time lag. But in spite of such success stories, more species are still coming under threat. The most significant factor threatening species continues to be changes in their habitats. There is a need to complement the conservation and management of habitats with conservation plans for individual species and new ways to exploit the opportunities provided by legislation.

The inadvertent introduction by man of exotic species into new habitats is not a new phenomenon. Non-native species are sometimes able to exploit ecological niches where they face no competition, or where their proliferation can lead to the decline or even the extinction of native species. The rapid growth in the volumes and speeds of all kinds of traffic has been the most important factor behind the recent spread of many invasive species. Other anthropogenic environmental impacts such as climate

change can exacerbate such problems where the new conditions favour invasive species. New exotic species are regularly observed in Finland. Marine invasive species are particularly spreading due to increasing maritime traffic.

The sustainable use of genetic resources

The increasing use of genetically modified organisms (GMOs) around the world has made it essential to regulate their international transportation and use so as to avoid any negative impacts on biodiversity and its sustainable use. The Cartagena Biosafety Protocol, which came into force in 2003, aims to strengthen international measures controlling the safety of the international transportation of GMOs, responsibility for accidents, and rules on their identification. Before GMOs can be safely used in the environment, risk analyses and monitoring methods must be further developed on the basis of multidisciplinary knowledge. Public information and participation in the related decisionmaking must also be strengthened.

The CBD also stresses the need to conserve and protect species and their genetic resources outside natural environments, in zoological and botanical collections and institutes. In Finland objectives and measure related to these types of ex situ protection have been compiled in the natural resource strategy and national animal and plant gene resource programmes by the Ministry of Agriculture and Forestry.

The Bonn Guidelines (Decision VI/24) concern access to genetic resources and the fair and equitable shar-

ing of the benefits arising out of their utilization. Compliance with the Guidelines is voluntary, and their objective is to guide users and providers of genetic resources in situations in which such resources are exchanged within and between countries. The Guidelines explain the various stages in the process of accessing genetic resources and sharing their benefits, and stress the duty of users to seek the prior informed consent (PIC) of the providing party. The Guidelines also explain the basic principles for mutually agreed terms, and they define the responsibilities of users and providers. The Guidelines also deal with other factors such as incentives, issues of liability, means of verification and settlement of disputes, and they contain a proposal on the elements of a material transfer agreement (MTA).

At the first stage of implementing the Bonn Guidelines nationally, a decision must be made as to the kind of system that is desirable for Finland, and whether new legislation on access to genetic resources and benefit sharing will be needed to implement this. The system to be created and the instruments to be employed for its implementation must be harmonised with other national and international legislation on genetic resources. The starting point for developing a system concerning access to genetic resources and benefit sharing will be the basic principle of the CBD according to which States have sovereign rights over their own natural resources.

Strategic objectives and the key means to achieve them

Objective 1. Improving the conservation and management of biodiversity

The conservation of biodiversity will be promoted by improving Finland's network of protected areas and the protection of species.

Key means:

The main goal of the 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 they depend should be managed using natural methods by 2015.

After the implementation of existing national conservation programmes and Finland's Natura 2000 network is completed, most of Finland's extensive natural areas or threatened areas as defined in the CBD's programme of work on protected areas will be under protection. Finland's network of protected areas is already relatively representative in the northern and eastern parts of the country, but there is still particularly a need to protect forest biodiversity better 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 2007. Protective measures will be defined for areas al-

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ready acquired for the purposes of nature conservation by the State through legislation and land use and management plans. The natural state, extensiveness and interconnectivity of protected areas and natural corridors between areas will all be improved through the adoption of natural management methods, habitat restoration schemes, land use planning at the 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 marketbased 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.

Forest biotopes in Southern Finland and the important habitats and structural features of forests for threatened species should be safeguarded by expanding the network of protected areas, by improving the linkages between these areas, by increasingly managing and restoring habitats in protected areas, and by developing natural management methods for commercially managed forests. To achieve these goals, a new forest biodiversity action plan designed to significantly improve the ecological state of forests in Southern Finland should be prepared on the basis of the METSO Programme. This new programme of funding and measures should define the main areas for action, and be prepared in co-ordination with Finland's next National Forest Programme. During the preparatory stage the impacts of alternative measures on greenhouse gas balances must be assessed.

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 fens should be more effectively protected, with such habitats increasingly restored. Problems related to maintaining natural hydrological conditions should be resolved through land use and management plans drawn up for protected mires. Legislation must also be improved to ensure that peatlands are used sustainably.

Habitat restoration plans should also be drawn up and implemented for wetlands with rich biodiversity. The impacts of previous restoration measures must continue to be monitored to ensure that successful management methods are continued.

Farmland biodiversity must be promoted by continuing to improve the conservation and management of traditional agricultural habitats and their species, by paying more attention to the conservation and management of biodiversity also in more typical modern farmland habitats, and by assessing opportunities to compensate for the loss of traditional farmland biotopes by suitably managing areas such as grassy road verges.

The objective of ensuring that inland waters are in at least a good ecological state can be achieved through the implementation of the EU Water Framework Directive and Finland's new water protection outlines (2006). The diffuse loads entering watercourses from farmland can be significantly reduced by carefully channeling agri-environmental subsidies. Steps must be taken in Southern Finland to preserve any small water features that are still in their natural state or a comparable state. Natural values should be restored in radically altered river basins,

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by restoring and rehabilitating small water features. Water quality should particularly be improved in important or potentially important spawning areas for migratory fish, and barriers to the movements of migratory fish should be removed. Aquatic diversity should be increasingly monitored and considered in impact assessments. Adaptive measures to protect biodiversity against the impacts of climate change should also be developed.

To produce data on marine and coastal ecosystems and provide a basis for the planning of protective measures for marine biodiversity, The Finnish Inventory Programme for the Underwater Marine Environment (VELMU) was set up in 2004 by the Ministry of the Environment together with Metsähallitus, other organisations within the environmental administration, and various universities and research institutes. The data from VELMU will also be needed for the implementation of the EU's marine strategy and the objectives set out in the Commission's proposed Marine Strategy Directive. This inventory should be finalised by 2014, by which time the necessary monitoring system should also be established.

The implementation of Finland's shore protection and bird wetlands conservation programmes will be completed, with the land use and management planning for these areas implemented according to priorities. Areas that have been designated for protection by the State but not yet included in conservation programmes in local master plans, regional land use plans or the Natura 2000 network, will be evaluated to enable the prioritisation of protective measures, and to assess the need for land use and management plans. Protective measures will then be implemented as necessary. Coastal biotopes in need

of protection as defined in the Nature Conservation Act should be designated for protection by the regional environment centres.

The monitoring of protected areas should be intensified to help anticipate the impacts of climate change, especially in Eastern and Northern Finland. Research and the preparation of measures related to adaptation should be promoted in collaboration with the other Nordic Countries and Russia. Important policy tools with regard to the conservation and sustainable use of biodiversity include the legislation controlling reindeer herding, environmental impact assessments for development projects, land use planning for protected areas and wilderness areas, and other forms of land use planning. Special land use planning solutions adopted in the Sámi homeland may 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 are fulfilled in Finland.

The use of rocks, gravels and sand should be more effectively controlled. Inventories already initiated by the environmental administration should be completed, and the resultant data made available to all interest groups. Mining legislation should be fully revised to ensure mining operations give due consideration to the need to conserve biodiversity.

Sun-baked habitats valuable for their biodiversity and comparable manmade habitats should be evaluated with a view to improving their protection and management.

The protection of species can be improved by applying existing legislation more effectively and by redirecting

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resources. The conservation programmes so far drawn up for specific threatened species are insufficient, and only a small proportion of the occurrences of species in need of special protection have been defined. Red Lists summarising the status of threatened species in Finland are compiled every ten years, and threatened species are also monitored as part of the national biodiversity monitoring system. Measures to protect threatened species and their habitats are implemented with priority given to the species considered to be most in need of protection on the basis of monitoring and assessments. The most cost-effective means must be applied in such conservation work.

Objective 2. Intensifying sectoral responsibility

The conservation and sustainable use of biodiversity will be promoted as an integral part of planning and activities in all socio-economic sectors.

Key means:

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. Very good progress towards such responsibility has already been made within Finland's national administration. The implementation of this new strategy 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 must 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. 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 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 beneficial natural values and processes known as ecosystem services. The ecosystem approach is already being applied in various projects in Finland. Methods derived from this approach are already used for instance in the planning of the use of water resources, and in regional forestry planning. Such approaches must also be more widely applied in regional planning related to the management and use of natural resources.

There is also a need to assess opportunities to apply the ecosystem approach in different circumstances, and evaluate the likely benefits and disadvantages. Because of their international context, the often complex related

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concepts, principles and guidelines should also be clarified.

The CBD requires environmental impact analyses (EIA) 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 evaluated 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.

Finnish citizens value beautiful and diverse natural environments. Public participation and dialogue should be increased in EIAs, so that the views of the public can be heard in addition to those of the experts. The ecosystem approach can particularly be applied in EIAs at the level of plans and programmes, where real alternatives and wider regions can more easily be assessed. Evaluations should pay more attention to the practical benefits that can be obtained from biodiversity, and 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.

Objective 3. Building up an improved knowledge base

Research data will be produced and disseminated to support active and costeffective policies designed to promote the conservation and sustainable use of biodiversity.

Key means:

Increasing amounts of research data have recently become available on the current state and trends in biodiversity in Finland, and on the effectiveness of possible means to help maintain biodiversity. Major completed or ongoing research and development projects (and the main organisations responsible) include:

- An evaluation of the representativeness of Finland's network of protected areas (SAVA Project, 1997-2002, Finnish Environment Institute)
- The Finnish Biodiversity Research Programme (FIBRE, 1997-2002 and its development project BITUMI, the Academy of Finland)
- Assessment of the need for protection in the forests of Southern Finland and Ostrobothnia (ESSU working group, 1999-2000, Ministry of the Environment)
- The biodiversity research programme (MOSSE, 2003-2006, Ministry of Agriculture and Forestry & Ministry of the Environment)
- Programme of research into data deficient and threatened forest species (PUTTE, a subprogramme of the METSO Forest Biodiversity Programme for Southern Finland, Ministry of the Environment)
- The Baltic Sea Research Programme (BIREME, 2002-2005, Academy of Finland)

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- Finnish Inventory Programme for the Underwater Marine Environment (VELMU, 2003-2014, Ministry of the Environment)
- Capacities of Finnish society and the environment to adapt to climate change (FINADAPT, 2004-2005, Finnish Environment Institute)
- Means to safeguard forest biodiversity, and their social impacts (TUK, 2005-2010, Finnish Forest Research Institute).
- The environment and law research programme (ENVLAW 2005-2008)
- Research programme on the Environmental, Societal and Health Effects of Genetically Modified Organisms (ESGEMO 2004-2007)

New research programmes due to be launched in 2007 include the Academy of Finland's sustainable energy programme and the EU's BONUS Baltic Sea research project.

More efforts must be made to improve the dissemination of research results to decisionmakers, and to intensify dialogues between researchers and datausers. More multidisciplinary and social science research should be conducted on issues related to biodiversity. More research should also be specifically designed to support decisionmaking 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 need-

ed to reduce or adapt to these impacts. This is a global challenge, and Finland should particularly play a leading role in improving collaboration between countries in the boreal and arctic regions.

During the monitoring of biodiversity, data is collected on the changes occurring in ecosystems, habitats, species, species communities, gene pools and genes. More than 60 biodiversity monitoring projects are currently under way in Finland. These monitoring projects form a good basis for the overall organisation of biodiversity monitoring, but several projects still need to be developed, and new monitoring projects need to be launched to cover many more aspects of biodiversity. Cooperation between the different organisations working on such monitoring projects should particularly be improved. Monitoring data should be made easier to exploit, more available to other users, and better reported.

Open databases should be built up through networking, containing details of monitoring work, the organisations involved, the resultant data, and related reports. The objective is to create by 2010 an umbrella monitoring system covering all kinds of data on the state of biodiversity and ongoing trends. Data on biodiversity should be organised so that it is easily available to all stakeholders, no matter where or for whom it has been collected.

Public opinion surveys have shown that the need to conserve biodiversity is well understood by the Finnish public. By international standards, Finnish citizens are highly aware of nature conservation issues. The Finnish Clearing-House Mechanism of the Convention on Biological Diversity (LUMONET) has been established to meet the needs of all kinds of stakeholders interested in

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the conservation and sustainable use of biodiversity. The ministries and other stakeholders responsible for implementing the national biodiversity strategy and action plan should prepare materials related to their fields for inclusion in the jointly accessible LUMONET portal. This will promote collaboration between the various parties involved in the action plan, and increase stakeholders' mutual understanding of the role of biodiversity in society.

Experiences with the METSO Forest Biodiversity Programme for Southern Finland suggest that good results can be obtained costeffectively through voluntary measures. From the conservation authorities' point of view, the results obtained from METSO so far indicate that it would be well worth continuing to develop such means. It is also important to maintain public interest through publicity measures, advice, instruction and encouragement for hobbies related to nature. NGOs and amateur naturalists do a lot of valuable voluntary research and monitoring. Such work should be encouraged by improving publicity and the provision of feedback. Rapid developments in internet communications are opening up a wider range of opportunities, enabling more people to contribute and utilise information about the natural environment. Advisory work already plays a key role in agriculture and forestry, and can also be used to promote the preservation of biodiversity.

The basis for citizens' ecological expertise, environmental awareness, and interest in natural history is created during basic schooling. It is important that researchers and the authorities should co-operate with schools and educational institutes to enable the active participation of pupils and students in conserving and shaping biodiver-

sity in their own surroundings. Public awareness of the importance of biodiversity should be strengthened by improving various forms of collaboration between researchers, officials and educational institutes at all levels.

More information should be provided about the ecological bases for biodiversity and the benefits of conserving biodiversity for the national economy, businesses, and individual citizens. Publicity is especially needed for examples of good practices. The administration should help to spread easily understandable and motivating information about complex issues related to biodiversity. Finland's own special responsibility for species and habitats found in this country should be highlighted. Co-operation between ministries and other stakeholders should be intensified through a communications programme designed to boost public awareness and approval of the conservation of biodiversity.

Objective 4. Strengthening co-operation

Extensive co-operation will be ensured between the ministries and other organisations working for the conservation and sustainable use of biodiversity.

Key means:

The conservation and sustainable use of biodiversity requires intensified and purposeful co-operation across administrative boundaries. Administrators must also openly and creatively collaborate with the scientific community, local authorities, nongovernmental organisations, the private sector and other stakeholders. The new strategy and

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action plan have a timeframe of ten years. This means they will have to be implemented under at least four different governments. It is vital that the continuity of this implementation can be guaranteed and the necessary revisions conducted whenever new governments are formed. 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 in government circles such as project portfolios and policy programmes.

When the strategy has been approved, a widely based body must be set up to oversee its implementation and monitoring. This body must include representatives of all key actors from the public and private sectors, non-governmental organisations and other interest groups. This body must strive to create a jointly agreed vision of how the implementation of the strategy and action plan should be organised by the administration, and how various stakeholders can participate in this work. In addition to supervising the monitoring of the implementation of the strategy and action plan, this body will also be responsible for evaluations of trends in the state of biodiversity in Finland, assessments of the need for revisions to the strategy and action plan, and the building of constructive dialogues between administrative sectors and other actors.

Key tasks related to biodiversity will be conducted

under the administrative supervision of the Ministry of the Environment by the Finnish Environment Institute, Finland's 13 regional environment centres, Metsähallitus, and the Finnish Forest Research Institute. Tasks related to forestry will be 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, and 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.

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The responsibilities and duties of the various organisations responsible for the conservation of biodiversity have gradually taken shape over time without any clear overall vision, and the way these responsibilities are currently shared is not necessarily optimal. 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 organisation on the basis of their core tasks and processes.

Objective 5. Improving Finland's international influence

The preservation and sustainable use of biodiversity will be promoted globally through international co-operation.

Key means:

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

Finland is committed to maintain its own natural biodiversity as part of the boreal ecological zone. From a Finnish perspective trends in neighbouring regions of the boreal zone are also crucial. Finland particularly strives to co-operate with Russia on nature conservation, and has

also provided expert assistance to countries in Eastern Europe and the Baltic region preparing for accession to the EU. The conservation of arctic biodiversity is also the focus of extensive co-operation, where Finland's most important partners are neighbouring Russia, Norway and Sweden. Finland's experiences are also now being communicated to the nature conservation authorities in other countries currently considering EU membership. Close co-operation on the implementation of Community legislation and the exchange of experts and experiences will benefit Finland as well as its Eastern European partners. Important objectives in NW Russia include the establishment of a network of protected areas as defined in international agreements, the development of good land use and management practices for protected areas throughout the Green Belt of Fennoscandia, and improvements in the ecological sustainability of forestry throughout the region. Finland is also working together with all the HELCOM countries around the Baltic Sea to reach the nature conservation targets set for the Baltic Sea according to the marine working programme of the CBD. The EU Habitats Directive will also be duly implemented with regard to the Baltic Sea in co-operation with other EU member states.

International environmental agreements give all their parties both joint responsibilities and specific obligations. The industrialised countries have to help developing countries to fulfill their own obligations, for instance through technology transfer and capacity building. Supporting developing countries' efforts to implement international environmental agreements is also an integral part of the Finnish government's development co-operation pro-

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gramme. 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 still being improved with the help of objectives and measures related to the conservation, management and sustainable use of biodiversity. In recent years there has been much discussion about the opportunities for co-operation and synergies between different Multilateral Environmental Agreements (MEA). Such agreements tend to share many common and mutually supportive features and objectives. The CBD also supports the UN Framework Convention on Climate Change and the UN Convention to Combat Desertification. Implementing the CBD can for instance strengthen 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 regions and among impoverished groups in developing countries. Intensifying the co-operation and dialogues between the different fields covered by MEAs is a major challenge. The objective of halting the ongoing loss of biodiversity should be more widely incorporated into such agreements, which should also be made to support each other more effectively.

As a party to key international agreements on environmental issues and maritime law, Finland aims to promote the conservation of biodiversity globally. Finland supports the conservation of biodiversity in marine waters outside national jurisdiction both nationally and through the EU. Since current conventions do not yet ensure the conservation and sustainable use of biodiversity in these marine waters, the EU has worked to build up an agreement related to the implementation of the UN Convention on the Law of the Sea. An open biodiversity working group met at the UN in February 2006 to discuss the conservation of biodiversity in these international waters, and the group's second meeting in 2008 is expected to review the suitability of current international regulations.

The preservation of biodiversity is in many ways linked to trade, trade policies, and trade restrictions. The opening up of global trade and markets is leading to changes in both global economic mechanisms and the regional features of the use of natural resources. Free trade is part of economic mainstream thinking, but it is also important to strive through socio-political measures to prevent any harmful impacts that could endanger the ecosystem services on which we all depend. International legal agreements have proven to be good tools for conserving biodiversity. Implementing such agreements requires the sharing of responsibility between developed and developing countries. In the face of rapid changes, it is vital to safeguard the prerequisites for legislative, administrative and political stability in both developed countries and the more vulnerable developing countries.

Impacts of the strategy

Impact assessments

This new strategy has been prepared on the basis of the evaluation carried out during the years 2004-2005 of the National Action Plan for Biodiversity in Finland 1997-2005. Material from the recently completed MOSSE biodiversity research programme and reports from monitoring, assessment and research projects within the METSO Programme has also been widely used in outlining the strategy. No separate environmental impact evaluation process or publication has been created due to the comprehensiveness and applicability of the existing material from the sources mentioned above.

Ecological impacts

The strategy's key objectives – to halt the decline in biodiversity in Finland by 2010; to establish favourable trends in the state of the natural environment in Finland over the period 2010-2016; to prepare by 2016 for global environmental changes that may threaten the natural environment in Finland, particularly with regard to climate change; and to strengthen Finland's influence in the preservation of biodiversity globally through international co-operation – are all objectives that would lead to considerable environmental benefits in themselves.

The ecosystem services provided by the natural environment are of the utmost importance to mankind as a whole. But they also have great importance in a narrower

sense, particularly at local and regional scale, as sources of physical and mental recreation, and as the basis for entrepreneurial activities.

The achievement of the ecological objectives outlined in this strategy will depend on the details of how the strategy is implemented in practice. A separate National Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland for the period 2006-2016 has therefore been drafted jointly by various administrative sectors, compiling the key measures needed to implement the strategy. The detailed implementation of these measures will be resolved in the respective administrative sectors in connection with the definition of Government budgets, frameworks and action plans.

Impacts on the national economy

The main factors to be considered with regard to the environmental impacts of the strategy relate to Objective 1 – Improving the effectiveness of the conservation and management of biodiversity. According to this objective, the national network of protected areas should be developed, and the protection of species should be intensified. The strategy assumes that Finland's protected areas network will be basically complete when current national conservation programmes and the Natura 2000 network have been fully implemented. The most important issues still to be resolved concern:

- 1)** safeguarding forest biodiversity in Southern Finland
- 2)** completing the network of marine protected areas in Finland's economic zone

3) improving the interlinkages and coherence of Finland's network of protected areas

4) improving the protection of species.

1) Safeguarding forest biodiversity in Southern Finland

Forest biotopes, important forest habitats for threatened species, and important structural features of forests should be safeguarded by extending the network of protected forests, by increasingly managing and restoring forest habitats in protected areas, and by developing natural management methods for commercially managed forests. To achieve these objectives, the METSO Forest Biodiversity Programme for Southern Finland should be continued from 2007 onwards after the completion of its trial stage, as defined in the related Government decision-in-principle made at the end of 2007.

The METSO Programme (2003-2007) and the MOSSE biodiversity research programme (2003-2006) have produced plenty of wideranging data that can be used to assess alternative conservation policies and their likely impacts on the natural environment. The key results of the research data so far published can be summarised as follows:

- The desired positive environmental impacts in the context of conserving forest biodiversity in Southern Finland can only be achieved by coordinating the management of protected areas and commercially managed forests.
- In terms of the social impacts of conservation, it is vital that voluntary means form a basis for the preparation of

conservation work, and that favourable attitudes are maintained and further encouraged among forest owners and other stakeholders in the forestry sector.

- In terms of the national economy, increasing the areas of forest under protection and controls over the use of commercially managed forests will not have significant negative impacts, although this issue is linked to some uncertain factors, including the future availability of imported timber. Other economic impacts vary for different stakeholders in the forestry sector. Research results indicate that repercussions will mainly affect the forest industries, while forest owners will not be significantly affected.
- In terms of the Government budget, increasing the protection of forests means that public funds must be available for the implementation of conservation measures also after 2009 when the current conservation programme implementation period comes to an end. Costs will mainly be related to land acquisition and compensation payments. Voluntary conservation means are evidently the most costeffective option, at least in the short-term future.

2) Completing the network of marine protected areas in Finland's economic zone

Government decisions on the Natura 2000 network have added significantly to Finland's network of marine protected areas. The establishment of a sufficient network of representative and high quality protected areas is still hampered by a lack of data, however, since knowledge of aquatic ecosystems and biodiversity is still limited in

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Finland, as in other parts of the world. There is also uncertainty about how the EU Habitats Directive should be applied in marine areas outside member states' territorial waters. The EU Commission has consequently not yet approved the marine Natura 2000 networks so far submitted by member states. This process is still ongoing.

Finland has already launched a major research inventory of the marine environment (VELMU), which aims to build up more knowledge about marine biodiversity in all Finnish waters of the Baltic Sea. This project is being conducted in co-ordination with similar international projects. The results of the inventory may indicate where additional protected areas are needed. There is a particularly urgent need to discover whether marine waters in Finland's exclusive economic zone within the Baltic Sea contain marine biotopes or occurrences of certain species that would justify such areas' inclusion in the Natura 2000 network. Such new areas could be designated where submarine features are not currently under exploitation pressures to such an extent that their possible additional protection would have significant economic, social or cultural impacts. The exploitation of resources on the seabed is currently increasing significantly.

3) Improving the interlinkages and coherence of Finland's network of protected areas

According to the strategy, the ecological structures and functions of existing and new protected areas can only be effectively preserved if the surrounding commercially used areas on which they depend are managed using natural methods by 2015. In many cases the natural state

and ecological functions of protected areas can only be safeguarded if their habitats are suitably managed or restored, and if the harmful effects of the economic use of surrounding areas are reduced. This can only be achieved through a wide range of measures whose costs, effectiveness and social and economic impacts are very difficult to predict without further study. It can be assumed, however, that for measures to be costeffective they should be based on existing systems of planning and participation. The results of the METSO Programme also indicate that measures where landowners and citizens are closely involved may provide interesting new opportunities. Deficiencies in research data and the monitoring of biodiversity are in many respects limiting factors.

Improving the interlinkages and coherence of the protected areas network is a costeffective measure in terms of public spending. This issue concerns much smaller areas requiring stricter protection than those included in previous conservation programmes. The functioning of Finland's network of protected areas can be greatly improved through less forceful means such as agricultural and forestry subsidy schemes, and further improvements in the natural management methods already being applied. According to the strategy, the national network of protected areas will be extended on the basis of the results of a major survey of Finland's threatened biotopes, which is due to be completed during 2007. It will only be possible to evaluate possible decisions on the scale and nature of future additions to the network after this survey has been finalized.

4) Improving the protection of species

According to the strategy, species protection can be improved through the more effective application of existing legislation and resources according to conservation priorities. Crucial measures include ensuring the availability of up-to-date geographical information, drafting of specific conservation and management programmes for certain species or species groups, and organising effective monitoring. Deficiencies in monitoring and data systems may also affect citizens' in legal terms, since conservation work includes many legal decisions that can limit citizens' individual rights and privileges. These deficiencies also mean that administrative decisionmaking on such issues is not yet sufficiently effective. It can be assumed that investments in monitoring and data systems will be repaid over time through consequent improvements in the effectiveness of decisionmaking on conservation issues.

The establishment of coordinated monitoring and data systems will involve major one-off investments, after which resources will also be needed for running the systems. After 2009, when current conservation programmes will have largely been completed, it should become possible to direct more resources into species protection, as long as the total sums budgeted for nature conservation remain at their present level.

Impacts on the national government budget

The national strategy for the conservation and sustainable use of biodiversity in Finland contains general policy guidelines that set out basic longterm objectives for

nature conservation, and also define means that can be applied to help reach these objectives. The strategy does not set detailed quantitative targets, so more detailed impact assessments can only be made when elements of the related action plan begin to be implemented. One basic principle has been that the strategy is to be implemented within the existing administrative budget frameworks. This means that the strategy will not in itself require significant increases in government spending, although its implementation may involve considerable changes in the ways resources are allocated.

Social impacts

The benefits to human wellbeing provided by biodiversity, including ecosystem services, have played a key role in the definition of the strategy's objectives. The economic value of ecosystem services to Finland has not been calculated, but it is clear that in qualitative terms biodiversity represents a cornerstone of Finnish lifestyles and values. Wideranging opportunities to use natural environments for recreational activities as well as fishing, hunting and the gathering of natural products, as permitted by Finland's liberal everyman's right of access to the land, are of great importance both economically and socially. Many nature-based pastimes have given rise to clubs and other associations that strengthen social ties and provide valuable opportunities for recreation even in sparsely populated rural areas. Conserving biodiversity is the only way to preserve such social assets. The conflicts that have arisen due to the ways earlier nature conservation policies have been implemented can be reduced by shifting

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towards the new kinds of conservation, participation, dialogue and communications highlighted in this strategy. The strategy requires a change of emphasis from the government authorities. The achievements of the MET-SO Forest Biodiversity Programme for Southern Finland include good examples of socially acceptable practices that can be exploited in this context.

Impacts on business

The conservation and sustainable use of biodiversity particularly supports and enables various types of business activity especially in the tourism sector. The economic impacts of conservation in terms of increases in tourism can be of great importance at the regional or local level. In some cases, however, the need to conserve biodiversity may prevent or limit some forms of natural resource use, or prevent certain developments on a local scale. Consequently the application of the most important such provisions from the strategy should be subjected to impact assessments, and measures to minimise social, economic or commercial risks or losses.





NATIONAL ACTION PLAN

for the Conservation and Sustainable Use of Biodiversity in Finland 2006-2016

The National Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland 2006-2016 includes a total of 110 measures proposed for the implementation of the National Strategy. For each measure the Action Plan also sets out schedules and defines which ministries are responsible. The ministry with primary responsibility for coordinating each measure is listed first. The measures have been prepared through collaboration with the Ministry of the Environment and the ministries with responsibility for the respective administrative sectors. The fact boxes presented in various parts of this plan, printed in italics, reproduce some of the most important relevant background information from the Convention on Biological Diversity.

Abbreviations for ministries

MAF	Ministry of Agriculture and Forestry
MD	Ministry of Defence
MEd	Ministry of Education
MEnv	Ministry of the Environment
MF	Ministry of Finance
MFA	Ministry for Foreign Affairs
MI	Ministry of the Interior
MJ	Ministry of Justice
ML	Ministry of Labour
MSAH	Ministry of Social Affairs and Health
MTC	Ministry of Transport and Communications
MTI	Ministry of Trade and Industry



Habitats and the use of natural resources

Forests

Background

Forests are the most widespread habitat type in Finland. Some 75% of the country (23 million hectares) is covered by forest (20m ha of forestland, and 3m ha of unproductive scrubland). More than 20 native tree species grow in the wild in Finland, but the most common species – Scots pine, Norway spruce and two birch species – account for 97% of all the timber in the forests.

Finland's forests have been greatly shaped by man over the centuries. Over the 90 years since Finland gained independence, the use of forests has been based on extensive inventories of their timber resources and detailed forestry research. After the Second World War, research activities and changes in forestry practices were largely designed to improve timber production, and forests began to take on their present structure from the

1950s, as forestry rapidly became more intensive. Even though forests have been intensely exploited in recent years, the total annual growth of timber across the country has usually exceeded the amounts of timber logged by about 40 million cubic metres a year. In 2005 some 70m m³ of timber was cut, of which 53m m³ was saleable timber. Some 84% of this saleable timber was logged in privately owned forests. In 2005 logging was carried out over a total area of more than 510,000 ha. The amounts of timber imported into Finland for use by the forest industries have risen rapidly in recent years. In 2005 some 21m m³ of timber was imported.

Today no major investments are being made any longer in projects designed to improve the exploitation of forest resources, such as mire drainage and forestroad-building schemes. Changes in the global economy mean that conditions for forestry and the forest industries in Finland are now less advantageous. Options for the future, currently under consideration in the context of the renew-

al of Finland's National Forest Programme, will also affect biodiversity. Climate change can be expected to have clear impacts in the forests, in terms of increased growth rates, higher tree lines, changes in the species composition of forests, northward shifts in the ranges of southern species, and increased risks of natural damage. The most recent national forest inventory indicates that broad-leaved tree species in general, and aspens in particular, are becoming more common in proportional terms. This ongoing trend may accelerate in the future if the climate changes as forecast. Conditions for spruce are contrastingly expected to worsen.

Current situation

Even though Finland's forest resources are used sustainably in terms of timber production, forest biodiversity has been impoverished, especially in the south. According to assessments made for the Red List survey of the threatened status of species in Finland in 2000, much more is now known about forest species than previously. Assessments nowadays cover a wider range of species groups, and this largely accounts for the fact that the number of new threatened forest species on the list is higher than the number of formerly threatened species removed from the list. At the same time, the statuses of previously listed species have improved slightly more often than worsened. This suggests that threatened forest species have benefited from the considerable efforts made during the 1990s to protect forest habitats in both commercially managed forests and protected areas. But the likelihood of extinction is still clearly rising for many species, especially since

The CBD's programme of work on forest biological diversity

The expanded programme of work on forest biological diversity (Decision VI/22) consists of three main elements: 1) Conservation, sustainable use and benefitsharing; 2) Institutional and socioeconomic enabling environment; and 3) Knowledge, assessment and monitoring. The programme's approximately 130 activities are designed to result in concrete measures.

These proposed activities are not legally binding, and each country may choose to implement them in their own way. The expanded programme of work and its implementation will be reviewed at the ninth Conference of Parties in 2008. A report was made on the implementation of the programme of work in Finland during the years 2003-2005, indicating that Finland's revised forest and environmental policies and forestry practices have effectively implemented most of the programme's proposed actions. The greatest challenges still ahead include the need to add to the network of protected forests in Southern Finland, and the need to resolve conflicts between forestry and reindeerherding interests in the north. The quantities of decaying wood and burnt wood in forests have increased, but remain low.

In addition to the programme of work on forest biological diversity, several other thematic programmes of work and decisions on cross-cutting issues within the CBD also affect forests, including the programmes of work on mountain biodiversity and protected areas, and decisions on the ecosystem approach, sustainable use, monitoring and evaluation, invasive alien species, climate change and biodiversity, and communication, education and public awareness.

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many of them live in the few remaining isolated oldgrowth forests of Southern Finland.

Herbrich woodlands, which are the most valuable habitats for threatened forest species, have been gradually disappearing over the centuries as such areas have been converted to farmland. Changes in forestry practices, habitat fragmentation, dwindling amounts of decaying wood and the spread of spruce trees have all worsened the ecological quality of herbrich woodlands. Surveys carried out in privately owned forests for the METE forest evaluation and planning project by the end of 2005 revealed the existence of 4,433 ha of patches of natural or seminatural herbrich woodland habitat as defined in Section 10 of the Forest Act. By December 2005 an estimated total area of about 6,100 ha of such habitat had been identified in forests of all ownership categories.

Forest fires used to be common in Finland, and they occur naturally in boreal forests. Today they only very seldom spread to any extent, due to changed attitudes and more careful supervision. Recent research has indicated that forest fires have in fact been less frequent events in natural forests than had previously been thought. Many of the species that benefit from fires may have only become more common in Finland when slash and burn farming techniques were widespread. Such species are now under threat due to the lack of forest fires. The controlled burning of forests by foresters also declined significantly by the mid 1960s, with the total area burnt amounting to only a few hundred hectares annually.

Three-quarters of Finland's fungus species and more than half of all the country's mammal species are associated with forest habitats. Herbrich woodlands have high

species diversity, whereas forests with dry and nutrient poor soils have relatively few species. Almost a third of all forest species are associated with herbrich woodlands, and 13% live in oldgrowth forests. The latest major red list survey of threatened species, published in 2000, found that forests are the primary habitat of 37.5% of Finland's threatened species. Of the 690 forest species under threat, 56% live in herbrich woodlands, 32% live in heathland forests, 5% in burnt forests, and 4% in esker forests. A total of 62 forest species have disappeared from Finland – a third of all nationally extinct species. Most of these vanished species are invertebrates, and especially beetles. Some 20-25% of forest species are dependent on decaying wood.

The Forest Act of 1997 incorporated new obligations to safeguard the ecological characteristics of natural and seminatural key forest habitat types. Such sites include natural herbrich groves, and nutrient rich spruce mires. The Nature Conservation Act additionally lists habitat types whose key ecological characteristics may not be altered. The forest habitats in this list include natural broadleaved woodlands dominated by nemoral species, as well as hazel groves, and alder mires. The breeding and resting sites of species listed in Annex IV of the Habitats Directive, including the flying squirrel, are also safeguarded under this Act.

The National Forest Programme for 2010 includes objectives related to the conservation and management of forest biodiversity. The pilot phase of the METSO Forest Biodiversity Programme for Southern Finland (2002-2007) has tested many new means to safeguard biodiversity. The MOSSE biodiversity research programme

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(2003-2006) has provided valuable new data which can be used to improve the planning of measures to safeguard biodiversity.

Metsähallitus (the authority that manages State-owned lands in Finland) and the Forestry Development Centre Tapio have renewed their forestry guidelines and recommendations to give more consideration to the need to safeguard biodiversity, particularly taking into account the need to promote forest features such as broadleaved trees and decaying wood. The Finnish Farmers' and Forestowners' Union (MTK) and forest industry companies have drafted programmes and guidelines of their own concerning sustainable ways to use and manage forest biodiversity. Increasing proportions of broadleaved trees, especially aspens, are already becoming evident in national forest inventories. The Finnish Forest Certification System (FFSC) and the parallel Forest Stewardship Council (FSC) scheme both promote the conservation of forest biodiversity.

According to UN FAO definitions of forests, a total area of some 2,881,000 ha of forest and scrubland in Finland is under protection or limited commercial use – amounting to about 13% of all of Finland's forestland. Of this area some 2,058,000 ha (9%) is classed as protected, including 1,885,000 ha of strictly protected forest or scrubland (8.2% of Finland's forests). These strictly protected areas are not exploited for their timber at all. The largest areas of protected forest lie within officially designated Wilderness Areas and National Parks. In Southern Finland, some 422,000 ha (3.6%) of forest or scrubland are under protection or limited use, of which 203,000 ha (1.8%) is strictly protected. Excluding scrubland, some

4.5% of forestland throughout Finland is strictly protected, and 1.5% in the south.

The conservation programmes for oldgrowth forests and herb-rich woodlands aim to protect these endangered forest habitats. It is estimated that particularly important forest habitats of the types listed in Section 10 of the Forest Act cover a total area of about 130,000 ha in forests of all ownership categories. Landscape ecological plans drawn up by Metsähallitus for state-owned forests delimit 130,000 ha of forest designated for nature conservation programmes, for Natura 2000 or for conservation under other approved plans, so that these areas can be protected by avoiding their commercial use. Outside of these areas considerable areas of forest of different ownership may also temporarily remain outside commercial use, even though these areas are not included in conservation statistics. Some of Southern Finland's forests are on islands, along shores, or for other reasons related to their location have not been cut for a significant period of time – although such areas are mainly small strips of land. The Act on the Financing of Sustainable Forestry enables subsidies to be granted to forest owners to help them manage ecologically valuable features in commercially managed forests more than would be required under the Forest Act. Research has indicated that good ways to promote biodiversity include increasing the amounts of decaying wood by leaving retention trees, and carrying out controlled burning. Such measures can be encouraged through forestry recommendations and official advice given to forestowners.

The METSO Forest Biodiversity Programme for Southern Finland was approved by the Government in

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2002, in order to provide longterm safeguards for forest biotopes and their important structural features and habitats for threatened species. The programme is being carried out jointly by the Ministry of the Environment and the Ministry of Agriculture and Forestry.

The METSO Programme has involved 17 areas of action. The measures applied during the initial trial phase of the programme can be divided into four main categories:

- habitat restoration and management in protected areas
- pilot projects involving new conservation means
- improvements in the natural forestry methods used in commercially managed forests
- research

The new tools to safeguard biodiversity tested in the METSO Programme – natural values trading, competitive tendering, nature management areas and co-operation networks – are all based on the voluntary participation of landowners. Criteria defined by conservation biologists have been used to define the forest habitats and features that require action most urgently. METSO particularly aims to promote the favourable management and conservation of heathland forests with plenty of decaying wood, herb-rich woodlands, spruce mires, swampy woodlands, sunlit esker slopes, wooded pastures and meadows, and natural forests along emergent coastlines. The impacts of the METSO Programme were assessed during 2006. The programme's first phase ends during 2007, when the Government will decide on further measures to benefit forest biodiversity in Southern Finland.

Challenges

The only way to achieve and maintain favourable conservation statuses for forest species and biotopes is through longterm systematic actions involving co-operation between stakeholders.

The network of protected areas particularly requires extension in the south, to improve its representativeness and interlinkages.

Objectives

The declining trends among forest species and biotopes should be halted by combining a regionally comprehensive network of protected areas with the application of natural forestry methods in commercially managed forests.

Measures

- 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.**
 - MEnv and MAF, Government decision due in late 2007, 2008-2016
- 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.

• MAF, 2006-2016

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. • MAF, MTI, MEnv, 2007-2008

Mires

Background

About a third of Finland's surface area has been classified as peatland (9 million hectares), but the extensive exploitation of these peatlands has greatly reduced the biodiversity of Finland's mire habitats. Of an estimated original total of 10.4m ha of natural mires, fewer than 40% remain in their natural state, due to their conversion into farmland, their use for forestry, the extraction of peat, or the construction of reservoirs for hydropower. The most widespread changes have occurred over the last 60 years. Peatland species have continued to decline over the last 10 years, even though practically no new mire drainage schemes have been carried out.

The decline in mires of a natural state has particularly affected mire types earlier considered to be most suitable for conversion into farmland, or used to grow timber or for peat extraction. Nutrientrich mires have widely disappeared due to the spread of farming and forestry. The total remaining area of unditched nutrientrich mire types such as open fens, pine fens, spruce fens and herb-rich spruce mires is now just a tenth of the total extent of such habitats in the early 1950s. The remaining mires are now smaller in size, and increasingly distant from other areas of similar habitat. In the Suomenselkä region of Central Finland, for instance, the total areas of unditched and unplugged mires and mireforest marginal zones are less than a tenth of their original extent. In many areas mires and mire complexes with natural hydrological conditions are endangered overall. There are hardly any large natural mire complexes in

Southern Finland, and the distances between the remaining unditched mires have grown. This leaves species that depend on mires with fewer and fewer refuges.

Current situation

Mires have mainly been protected around Finland under the Government approved National Mire Conservation Programme and the National Programme for the Development of National Parks and Strict Nature Reserves. Government decisions on the Natura 2000 network have improved the representativeness of the network, especially where nutrientrich mire types are concerned. Mires with a total extent of about 1.125 million hectares are today under protection – about 13% of the total area. According to statistics from June 2006 on protected forest areas, the total areas in forests of all ownership categories of habitat types listed in Section 10 of the Forest Act are some 25,000 ha of sparsely wooded mires, 3,400 ha of fens, and about 4,500 ha of nutrientrich spruce mires. An earlier survey revealed just over 100 ha of alder mires – a habitat type that is very rare in Finland, and protected under the Nature Conservation Act.

There are considerable regional variations in the numbers of mires of various kinds under protection. The average percentage of spruce mires under protection in the concentric raised bog and eccentric raised bog zones of Southern Finland is just 0.5%. The percentages of other nutrientrich mire types under protection are also low, except in Lapland. The preservation of fens and nutrientrich spruce mires can be enhanced by safeguarding areas identified in the METE surveys. Few of the mires at vari-

ous stages of development along emergent coastlines or the mosaiclike mireforest complexes of smaller pine mires and spruce mires in Southern and Central Finland lie within mire reserves. The areas designated for protection are often so restricted that the protected mires are affected by the drying effects of drainage ditches dug outside the areas under protection.

Finland's most recent Red List survey of threatened species, from 2000, estimates that 67 peatland species are under threat. Many of these threatened species occur in fens. The threatened species monitoring group has listed species occurring in Finland whose survival internationally is largely dependent on their survival in Finland. Of these species for which Finland bears a special responsibility, 48 are associated with mires, and 16 of these species are threatened in Finland.

In recent years the changes affecting the natural state of mires have slowed. There are today hardly any new drainage schemes, but the maintenance and internal extension of existing ditch networks continue to affect habitat conditions for peatland species, and also increase loads in water bodies. The extraction of peat for use as an energy source also continues to change peatland environments on a local and regional scale.

The pressure for the exploitation of peat reserves for energy is increasing. Peat extraction in natural mires is limited by various factors, including the importance of natural mires in regulating hydrological conditions in river basins. The harmful impacts of such hydrological disruptions can have significant negative impacts on local and regional fisheries.

Challenges

There are considerable gaps in mire protection in Southern Finland both in regional terms, and for certain mire types. In order to safeguard mire biodiversity, it is important to restore natural conditions in the most ecologically valuable mires. So far mires drained for the purposes of forestry have only been restored almost exclusively in Stateowned protected areas. It has been estimated that a total area of more than 20,000 ha of mires need to be restored in protected areas administered by Metsähallitus. By the end of 2004 about half of this total area had been restored – some 11,000 ha.

Even though this type of habitat restoration work is mainly done in protected areas, it would be very favourable for mire species elsewhere if more natural conditions could be restored in drained mires where forestry is no longer profitable. This could also help to limit nutrient loads and any increases in flooding caused by climate change. Trials and more information are still needed to facilitate the planning and implementation of habitat restoration schemes in underprotected fen and spruce mire habitats. Other challenges concern the need to adequately monitor the implementation of costeffective habitat restoration measures and their ecological impacts.

Objectives

Mire habitats and their species diversity should be safeguarded. Measures should be taken to encourage the stabilisation and strengthening of the populations of threatened mire species.

Measures

- 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 longterm impacts of restoration on loads in watercourses downstream and on greenhouse gas emissions. • MEnv and MAF, 2006-2016
- 5)** Forest planning, voluntary conservation means 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. • MAF, MEnv, 2010-2016, see 4)
- 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. • MAF and MEnv, 2007-2016
- 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 • MTI, 2007-2016

Wetlands

Background

Wetlands are included together with mires and inland waters in the CBD's programme of work on inland waters. Their conservation and restoration are also covered by the international Ramsar Convention on Wetlands. Both conventions recognize that the ability of natural wetland ecosystems to thrive and recover has been so disturbed that active restoration and management measures are needed. Other international agreements covering migratory species (the Bonn Convention and the African Eurasian Waterbird Agreement - AEWA) also stress the importance of preserving wetlands globally. The EU Birds Directive also gives wetlands a special position due to their importance for birds. Finland's Bird Wetlands Conservation Programme (1982) protects all species and subspecies found in wetlands in Finland together with the physical natural features of their habitats.

Current situation

Wetland habitat restoration schemes aim to halt the decline in wetland species diversity, and recreate suitable wetland habitats. Wetland habitat restoration work has already been done in various wetland sites, using various methods. The most important and effective methods that can be applied in sea bay wetlands are evidently the recreation of shore meadows previously overgrown by reed beds, and the maintenance of shore meadows through grazing.

The Bird Wetland Conservation Programme covers 289 designated sites (74,750 ha), representing various types of habitat around lakes and their shores, in shallow waters, in nutrient-rich bays and in deltas. So far over 60% of the original, privately owned area under the programme has already been protected or acquired by the State. Finland's Natura 2000 network includes 467 SPAs as defined in the Birds Directive, with a total area of 3.1m ha (9% of Finland's total area). These sites include areas where migrating birds rest, as well as important breeding areas. A total of 49 wetland sites in Finland have also been registered under the Ramsar Convention on Wetlands.

Measures taken to restore lakes with rich birdlife have typically involved raising water levels, and the removal of excess aquatic vegetation through dredging. Willow beds have also been cut to make swampy shores more open. Such work has particularly aimed to benefit threatened bird species including lesser whitefronted geese, dunlins of the southern subspecies *Calidris alpina schinzii*, yellowbreasted buntings, and blacktailed godwits, but such measures have also enhanced habitat conditions for almost all wetland birds.

The rural development programme for mainland Finland for the period 2007-2013 contains a new form of investment subsidy for wetlands with multiple impacts, which aims to promote biodiversity as well as water protection. Subsidies can be used to establish wetlands and wetlandlike flooded areas in sites where such habitats would be likely to occur naturally and in fields sensitive to flooding. Funds may also be used to restore more natural watercourse channels according to principles defined for

The CBD's programme of work on the biological diversity of inland water ecosystems

The CBD's programme of work on the biological diversity of inland water ecosystems (Decision VII/4) covers lakes, rivers, other watercourses, flooded areas and various types of wetlands and mires. The programme's objectives and measures have been divided into three programme elements:

- 1) conservation, use and benefit sharing;
- 2) institutional and socioeconomic enabling environment;
- 3) knowledge assessment and monitoring.

Many inland water ecosystems are endangered due to problems including land use, drainage, climate change, pollution and invasive alien species. The programme of work stresses the application of the ecosystem approach, particularly in the context of integrated river basin management. There is also a need to improve the evaluation of various types of natural values and the impacts of conservation measures. The lack of data on inland waters is a problem in many areas. The important ecological role of wetlands is being increasingly highlighted in the context of mitigating climate change and adaptation measures that will facilitate the preserva-

tion of biodiversity. The inland waters programme of work is closely connected to many other programmes of work and cross-cutting issues under the CBD, especially programmes of work on protected areas, forests and agricultural biodiversity, and decisions taken on the ecosystem approach, sustainable use, monitoring and evaluation, biodiversity and climate change, and financial instruments.

The programme of work has so far most notably been implemented for wetlands, largely through collaboration with the Ramsar Convention on Wetlands, including a joint working programme. In this co-operation the importance of wetlands for migratory species is highlighted. In Finland, the programme of work on inland water biodiversity has been implemented by promoting the conservation of inland waters, wetlands and mires, particularly by designating sites for the Natura 2000 network and the Ramsar Convention's list. Other significant actions to enhance the implementation of the programme of work include efforts related to the EU Water Framework Directive, the prohibition of new peatland drainage schemes, changes in water level regulation practices, and the protection of smaller water features under forest and water legislation.

natural watercourse development, by recreating natural flooded areas or establishing new smallscale wetlands.

Challenges

Wetlands are under many different types of pressure. Shallow, nutrientrich lakes with rich bird-life are mainly threatened by overgrowth, which reduces the areas of open water and destroys the natural mosaiclike variation of water and drier hummocks around swampy shores. Such shores can dry out and be taken over by willows and birches. Sea bays affected by eutrophication can suffer from algal blooms that cloud the water and restrict the growth of both floating and submerged aquatic plants. Many seashores and lakeshores have been taken over by beds of common reed, hindering the prospects for other plants to thrive. Varying water levels, winter ice conditions and water currents may serve to keep waters open and limit the growth of vegetation, but the higher zones of shores have widely become overgrown with reed beds and scrub. These trends have impoverished the species biodiversity of wetlands in both quantitative and qualitative terms. The eutrophication of watercourses has created and is creating new wetlands which are not yet protected in any way. This situation must be assessed, with consequent preparations made for extensions to the national Bird Wetland Conservation Programme.

Experts from the Finnish Environment Institute earlier estimated that habitat restoration measures are urgently needed at 163 of the sites within the Bird Wetland Conservation Programme. By 2005 such work had been com-

pleted or started at 55 of these sites. Plans are currently being made for restoration work in 34 more sites, but this still leaves 74 sites where nothing has yet been done. A further 32 conservation plans are to be drafted for the management and restoration of suitable habitat for the dunlin subspecies *Calidris alpina schinzii*.

Much has been achieved in recent years in the field of wetland conservation in Finland, but conservation objectives still need to be more specifically defined. Many wetlands are used by fowlers. Research results indicate that this use of wetlands could be improved by changing the controls over where and when such hunting is permissible, according to game management considerations. It is vital to safeguard the natural dynamics of wetland bird populations and the autumn staging areas of migratory waterfowl much more widely, by reducing such disturbance. The sites included in the Bird Wetland Conservation Programme include relatively few areas of transitional wetland margin vegetation types typical for bird wetlands, such as herb-rich wooded shores, spruce mires and swampy woodlands. In many cases habitat restoration and management work is hampered by the fact that the designated protected areas are too small in area.

Other challenges include opportunities to create more diverse wetland habitats for instance by restoring former wetlands, and by creating new wetlands in suitable sites including areas formerly used for peat extraction.

Objectives

Wetland and lake habitats and their species diversity should be safeguarded. Measures should be taken to encourage the stabilisation and strengthening of the populations of threatened wetland species.

Measures

8) Habitat restoration measures will be carried out at sites within the Bird Wetland Conservation Programme as prioritised, 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.

• MEnv and MAF, 2006-2016

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. • MEnv and MAF, 2006-2016

Inland waters and fish stocks

Background

Inland waters are included together with wetlands and mires in the CBD's programme of work on the biological diversity of inland water ecosystems, which aims to promote river basin planning, biodiversity monitoring for inland waters, and other actions.

The EU Water Framework Directive (WFD), which came into force in 2000 covering surface waters and groundwater, follows the principles of the CBD and its inland waters programme of work. The WFD aims to protect, enhance and restore surface waters and groundwater to ensure that their state does not worsen, and that they can be classed as having at least a good environmental and chemical status by 2015. Water quality monitoring in the EU will increasingly be based on biological factors such as vegetation, phytoplankton, periphyton, benthic fauna and fish.

Almost a tenth of Finland's surface area is covered by water. Finland has 187,888 lakes and ponds larger than 500 square metres in extent, and rivers with a total length of 25,000 km. Although there are so many waters in quantitative terms, most are shallow, and they only contain a total volume of 235 km³ of fresh water, which corresponds to just a quarter of the volume of Europe's largest lake – Russia's Lake Ladoga. Their shallowness makes Finland's lakes vulnerable to disturbances caused by human activities. Finland's inland waters have traditionally been classified into different biotope categories according to their size, vegetation and nutrient or humus content.

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The varying geomorphology of Finland's lakes gives rise to different kinds of lake ecosystems and species communities. The most diverse lake habitats are shallow shores where aquatic vegetation shelters many aquatic species. In rivers and streams, channel widths, depths and flow rates determine the structure and diversity of ecosystems. Midsized rivers tend to have the greatest species diversity, since they typically contain various kinds of habitat suitable for different species. Inland waters provide vital habitats for fish, dragonflies, caddis flies and many molluscs, as well as water birds and aquatic plants and mosses.

Land use changes and hydrological engineering projects have widely affected Finland's inland water habitats and the statuses of their characteristic species. Drainage and hydrological engineering schemes were carried out in many areas between the Second World War and the 1970s. Changes in land use have particularly affected smaller waters largely consisting of shallow waters and shore zones. Small rivers and streams have very widely been cleared and channelled to improve drainage. This has tended to lower water levels, increase the quantities of solid particles, and make flow conditions and habitats more uniform. Due to changing forestry practices the amounts of ecologically valuable decaying wood found in streams and rivers have been decreasing over a long period, although the present Forest Act safeguards the surroundings of small natural and seminatural water features, while the Water Act safeguards natural springs and stream channels.

Hydrological engineering schemes have particularly affected larger river basins. Water levels are regulated in

about a third of Finland's surface waters by area, and almost all of the country's large rivers have been harnessed to produce hydropower, so their water levels and flow rates are also controlled. Hydropower plants, weirs and dams all restrict the movements of fish and other aquatic organisms.

Finland's Fishing Act aims to maximise the longterm productivity of fish stocks, and ensure that fish stocks are exploited responsibly and sustainably. Activities that could disturb the natural balance of aquatic ecosystems are thus to be avoided.

Fishing rights in Finnish waters are generally held by the owners of the waters, who are usually the owners of the surrounding land. Waters are divided into 227 fisheries districts. Plans for the use and management of fishing waters in each district are drawn up according to requirements set out in the Fishing Act. Fishing restrictions may be imposed by these districts, including limits on catches of valuable species, minimum sizes of fish to be kept, or the numbers of fishing permits that can be sold. Fishing waters and fishery stocks are managed through fishing restrictions, stock introductions and habitat restoration work. In recent years stocking practices have increasingly been planned with regard to the need to preserve and increase the biodiversity of fish stocks, and the need for introductions. The overall objective has been to maximise the sustainable exploitation of naturally reproducing fish stocks.

Finland's inland waters contain 61 naturally reproducing native fish species, of which about 20 are actively fished, as well as one native crayfish species. Four non-native fish species and one exotic crayfish species have

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also established viable populations. Two fish species have become extinct in Finland – the Baltic sturgeon and the wels catfish. Lake salmon populations no longer reproduce naturally, but have to be maintained by introducing fish bred artificially in hatcheries.

Finland's most important rivers for migratory fish have all been harnessed for hydropower, except the rivers Teno, Tornio, Näättämö and Simo. Natural migration routes have consequently been cut off. Hydrological engineering, water level and flow regulation, dredging, clearance, and water releases from lakes have all affected aquatic and shoreline vegetation and the quantity and composition of benthic fauna of shore zones, and have an adverse effect on breeding conditions, particularly for autumn-spawning fish.

The increases in nutrient and particle concentrations in inland waters due to wastewater emissions, inputs from diffuse sources such as managed forests and farmland, and emissions from peat extraction sites and fish farms have all led to eutrophication and related problems such as the accumulation of silt in the spawning areas, nurseries and wintering areas of fish. This has led to problems including the lack of suitable food for fish species, the loss of spawning and wintering grounds, the destruction of fish eggs, and changes in the fish species composition. Sudden peaks in acidity or particle concentrations caused by construction work on the land or heavy rains can also be fateful for fish and crayfish.

Fish farming spread rapidly in Finland in the 1970s and 1980s. The total production of edible fish peaked in 1991, at some 19.3 million kilos. In 2004 approximately 12.8m kg of fish was produced in Finland for the table

– including 12.3m kg of rainbow trout. Fish farming is particularly concentrated in marine waters of SW Finland. Various species of fish are also widely bred around Finland for introduction. In 2004 a total of 225 facilities produced edible fish, of which 158 were located in marine waters. Fish hatcheries and facilities using natural fish pools are mainly located inland. With the exception of rainbow trout, most artificially raised young fish are eventually introduced into natural waters.

Current situation

In quantitative terms, many inland water biotopes are fairly well conserved. However, the numbers of small water features still in their natural state have declined, especially in the south. Many species dependent on such habitats are now threatened. Finland's network of protected inland waters includes 21% of the country's total area of lakes, and 16% of all shores. But many habitats found around smaller water features have declined. Waters and shores are better protected in the north than in the south. There is a need for more protection at the scale of whole river basins, since measures carried out in lakes and river channels alone may not be effective if the real sources of problems are elsewhere in their catchment areas. Current knowledge of aquatic biodiversity is uneven, and deficient in some respects.

There are few new major hydrological engineering projects these days, so efforts are focussed on improving existing schemes. Rising electricity prices are leading to greater interest in the renewal of older small hydropower facilities, and the harnessing of smaller streams to exploit

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their hydroelectricity potential has become more frequent. Such developments could severely restrict the movements of fish and other aquatic organisms.

Water level regulation development schemes have aimed to reduce the harmful impacts of water level regulation on aquatic and shore vegetation, benthic fauna, autumn-spawning fish, and fish that spawn in rivers and streams. Over the last decade about 80 such schemes have been initiated or completed. Few new drainage schemes are initiated today, but ditches are still occasionally restored when existing drainage networks are maintained and renovated.

The numbers of stream and river habitat restoration schemes have increased since the early 1980s. Such schemes typically aim to create and enhance suitable conditions in rapids for the spawning grounds and nurseries of migratory fish. The desired benefits will only be achieved if fish are able to reach these breeding waters from their feeding areas. The structures formerly maintained by the authorities to facilitate logfloating have now almost completely been removed to restore more natural conditions.

About 100 natural management schemes have been conducted as water protection projects. Natural spring restoration projects have been initiated widely. Smaller streams were widely cleared out in the 1970s and 1980s in connection with various drainage schemes. As the number of larger river restoration schemes declines, the focus is shifting towards the restoration of progressively smaller rivers and streams. New acts on nature conservation, forests and water enforced from 1997 have consid-

erably improved prospects for the conservation of smaller water features.

The numbers of lakes being restored have increased, with about 45 lakes now rehabilitated every year. This increase has largely been due to initiatives from the owners and users of lakes. Such schemes have only rarely considered biodiversity, as their main aim is to improve conditions for recreational activities. Efforts to combat eutrophication often have positive impacts on biodiversity, but smaller scale actions along shorelines may also have negative impacts.

Fish classified as endangered include the naturally reproducing charr population of the Vuoksi river basin, salmon in rivers flowing into the Baltic Sea, sea trout, and spined loach. The conservation prospects for Baltic salmon have improved considerably since the mid 1990s, thanks to the strengthening of naturally reproducing populations in the rivers Simo and Tornio. Populations classified as vulnerable include the salmon in rivers flowing into the Arctic Ocean, whitefish of the varieties *Coregonus lavaretus* and *C. muksun*, and asp. Near threatened species include lamprey, native trout populations in inland waters, charr outside the Saimaa lake system, the lake whitefish *Corygonus oxyrhynchus*, seaspawning grayling populations, and vimba. Rivers and streams are the primary habitat for most of Finland's threatened fish. Smaller waters with naturally reproducing stocks of trout, charr, whitefish, grayling, lamprey or crayfish are also valuable in commercial terms, as are waters where viable stocks of such species have been created through introductions.

Challenges

Most natural small water features in Southern Finland have been affected by man. Waters in most river basins in the south and in coastal areas are only in a satisfactory state or in a poor state, largely due to the impacts of diffuse loads. Rivers are still blocked by many old dams and weirs, restricting the movements of fish and sediments. The most favourable sites for waterside holiday homes have around many lakes largely been developed already, so newer lakeside developments are often located in less favourable areas for recreational activities, where dredging may consequently be increasingly required. Comparatively few natural small water features are left, and even though more attention has been paid to their preservation in forestry legislation, recommendations and guidelines, they often remain in a poor state.

Loads from point sources of pollution affecting inland waters have clearly decreased in recent years. But the objective of reducing diffuse loads significantly remains a major challenge in water protection. Migratory fish are most threatened by poor water quality in coastal rivers, and by dams and other barriers restricting their movements. Acidification and metal pollutants are still a problem in some rivers, and may lead to fish deaths and structural changes in ecosystems.

The factors threatening fish species and weakening their populations in Finland are most often related to the loss or deterioration of their spawning areas, or the presence of barriers to their natural migratory movements. Many of the fish populations affected have also been harmed by excessive levels of fishing considering their weakened state. With the exception of the spiny loach,

the other seven threatened species and all six near threatened species in Finland are all commercially exploited species. The precautionary principle should become the key factor determining the level of exploitation of fish stocks. On this basis, for instance, most fish of species whose breeding rates are dependent on the sizes of their spawning stocks should be left to spawn at least once before they are caught. Fishing regulations must ensure, for example, that more female sea trout are able to migrate upstream to spawn.

The prospects of threatened or weakened fish populations can primarily be improved through measures that promote their natural reproduction. Such measures include the restoration of potential spawning waters and nursery waters, the removal of barriers to their movements and the construction of ecological fishways, reductions in pollution loads, and the use of ecologically favourable methods where construction work affects waters. Controls over fishing and introductions can help to improve the impacts of these measures, and also promote the sustainable use of fish stocks. Outbreaks of fish diseases are hard to predict, and diseases themselves change rapidly. Diseases can be caused by bacteria, viruses, fungi, parasites or reproductive stress. They may lead to widespread fish deaths, typically affecting a single species. More widespread epidemics are often related to changes in water quality or temperature that reduce resistance to disease.

The most common cause of widespread deaths among crayfish in Finland is a crayfish plague spread by a fungal infection, which has destroyed crayfish stocks over wide areas. The disease is partly spread by introduced

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North American signal crayfish, which are themselves more resistant to the disease.

The most serious threat concerns the spreading of such diseases into new waters, and the arrival in Finland of new diseases. Such risks are growing as fish imports increase, especially as information and guidance is not available to all actors about the impacts of diseases and ways to prevent their spread.

Objectives

Water quality, biodiversity and the overall state of small water features and other inland waters, in particular river systems, should be improved. Pressures on smaller waters should be reduced.

Fish stocks should be exploited sustainably on the basis of up-to-date information. The spread of infectious diseases into Finland and between the sea and inland waters should be prevented. The spread of diseases such as crayfish plague and the most harmful parasites between river basins should be prevented. New means should be devised and adopted to identify crayfish plague rapidly and control its spread. Fish farms and natural fish populations should be protected against new and harmful diseases and parasites, especially in inland waters.

Measures

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. • MAF, MEnv, 2007-2013

11) Action will be taken to relieve the pressures on small water fea-

tures. The need for restoration work on small waters in Southern Finland will be assessed, and habitat restoration schemes will be implemented accordingly. • MEnv and MAF, evaluation 2008-2010, implementation 2010-2016

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 movements. Fish stocks will also be managed so as to promote their natural reproduction. • MAF, 2007-2016

13) Measures to reduce the harmful impacts of artificial water level regulation and 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 organised, and drainage basins will be restored according to the EU Water Framework Directive. • MAF, 2007-2016

14) Support will be provided to encourage a shift towards more environmentally favourable 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. • MAF, 2007-2016

15) Steps will be taken where necessary to reinforce declining stocks of valuable fish species through hatchery schemes and introductions of young fish. The preservation of threatened populations will also be safeguarded where necessary through naturalising introductions. Introductions of fish from one river basin into another will be limited, and other such transfers of fish will be more effectively controlled.

• MAF, 2007-2016

16) The Fish Health 2008 fish disease prevention strategy will be implemented. • MAF, 2006-2008

Farmland habitats

Background

Over the centuries farming has created many habitats in the Finnish countryside where farmland species have been able to thrive, and some species originally brought by man have been able to establish themselves in the wild in Finland. The clearing of fields has particularly created habitats for many species, including newcomers. Repeated grazing has created meadowlands with their own distinctive plant and animal communities. Farming had a most positive impact on biodiversity during the age of subsistence agriculture, which in many parts of Finland lasted until as recently as the 1950s and 60s, when the age of pastoral farming began to come to an end. Finnish farming has subsequently focused on arable crop cultivation in fields. The total area of meadowland declined rapidly and irreversibly to about a hundredth of previous levels. Meanwhile the areas of cropland grew correspondingly, and were cultivated ever more intensively using more effective machinery and purchased fertilizers and pesticides. The production of livestock fodder shifted from natural pastures and meadows to intensively managed pastures and cultivated hayfields. Recent structural changes in farm sizes have almost halved the total number of farms in Finland, with such changes especially occurring over the last decade. At the same time the ever larger remaining farms are increasingly specialising in the cultivation of fewer crops, and thus becoming more uniform in biological terms. Many farmland species that used to be common in the days of pastoral farming have become rare

The CBD's programme of work on agricultural biodiversity

The CBD's programme of work on agricultural biodiversity (Decision V/5) provides for an analysis of the state of and trends in agricultural biodiversity around the world, as well as their underlying causes, and local knowledge of agricultural biodiversity. The programme highlights the need to identify and promote suitable land use and management practices, policies and incentives. It also promotes the protection or sustainable use of genetic resources valuable in terms of nutrition and agriculture. The programme also covers new technologies such as Genetic Use Restriction Technologies (GURTs) and their possible impacts on the biodiversity of farmlands, biosafety, and agriculture in general. The programme also encompasses various crosscutting initiatives, including the International Initiative for the Conservation and Sustainable Use of Pollinators, the International Initiative for the Conservation and Sustainable Use of Soil Biodiversity, and the Crosscutting Initiative on Biodiversity for Food and Nutrition. The effects of free trade and globalization on agricultural biodiversity are also examined.

today. Increasing farm sizes, more intensive farming methods, and increased specialisation both within farms and on a regional scale all reduce the biodiversity associated with farmland.

Many wild animals and plants still thrive in habitats created and maintained by agriculture, benefiting from the open field landscapes, from the effects of grazing, and from many of the environmental practices encouraged in agriculture today, such as protective vegetation belts and buffer zones. But some of the wild species that have ben-

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affected from farming over the years have not been able to adapt to the changes in agriculture. Species dependent on wooded pastures, meadows and ditch margins have particularly declined. Meadows and wooded pastures have either been converted to fields, or reverted to forest through their overgrowth or active forestation. The total area of farmland has remained stable over recent decades, however. The shift from pastoral farming to arable farming has not led to the loss of open agricultural landscapes, and the total area of farmland in Finland has remained stable at about 2.2m ha.

Current situation

Farming in Finland is guided by the EU's Common Agricultural Policy. The policy aims to safeguard the multiple functions of farming, including food safety, environmental protection, and the maintenance of environmental benefits produced by farming such as cultural landscapes and biodiversity, as well as food production.

Farmland biodiversity has largely been maintained and managed through the agri-environmental support scheme within the Horizontal Rural Development Programme. The EU Commission adopted a new Rural Development Programme for the programme period 2007-2013 in August 2007. The biodiversity support measures are implemented mainly through the line 2 measures which are environmental subsidies and non-production investments. A related ex ante evaluation in Finland's Rural Development Programme and related environmental impact assessments have highlighted the inadequacy of the measures so far planned in relation to biodiversity,

also stressing how such objectives have clearly been made subordinate to agricultural objectives in cases where conflicts have arisen. In the new Rural Programme biodiversity supporting measures are among other things included in the environmental support scheme, for basic measures, additional measures, and for special agreements between farmers and the State as well as for non-productive investments. In 2005, environmental subsidies amounting to 298.4 million euros were paid to farmers in Finland. These subsidies were mainly channelled into water protection measures, so only a small fraction of this sum was spent on the management of biodiversity.

Plenty of data is available on agriculture and on farmland habitats. Various universities and research institutes have been examining agricultural biodiversity for several years. The largest single project has been the MYTVAS research project on the effectiveness of the Finnish agrienvironmental support scheme, which was launched in 1995 and is linked to the monitoring and evaluation of the Horizontal Rural Development Programme. During the project's second programme period (2000-2006), the research focus on biodiversity was intensified. The biodiversity research programme MOSSE (2003-2006) also had an agricultural element, which aimed to improve the tools used in the planning and monitoring of agricultural biodiversity.

Challenges

Over the last decade the number of farms in Finland has declined steeply, and farm sizes have increased correspondingly. The numbers of livestock farms have particu-

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larly decreased, leaving the remaining farms with more animals. Grazing has declined considerably. Farms and whole farming regions have become more specialised in ways that make farmland habitats and landscapes more uniform. At the same time, economic changes in the pricing of agricultural goods and the conditions for subsidies have meant that farmers are now less dependent on the sizes of their harvests for income, and this is tending to make farming practices more extensive.

The decline of grazing, the overgrowth of uncultivated fields, the disappearance of field verges and banks, and the loss of traditionally managed farmland habitats such as wooded pastures and meadows have all led to reductions in the formerly rich biodiversity of such habitats. Many insect, bird and mammal species are directly dependent on habitats shaped by agriculture. The spread of concealed drainage since the 1950s has led to the disappearance of open ditches and their verges from farmland. Such grassy verges are vital corridors for many animal species. In recent years more than 65,000 km of such verges and protective vegetation zones have been re-established using agrienvironmental subsidies. The overgrowth and eutrophication of meadowland habitats has meanwhile led to a decline in vital pollinators including butterflies and bumblebees. The most valuable farmland habitats for birds are fallow fields, pastures, meadows and other grasslands. Traditional agricultural habitats have provided birds with plenty of suitable nesting sites and shelter, as well as feeding areas.

Farmland meadows are disappearing from Finland. Their management has been subsidised through the agri-environmental support scheme, but this scheme is direct-

ed at commercially active farmers, and many traditional agricultural biotopes that are no longer in commercial use lie outside its scope. The proposal made for the agri-environmental subsidies for the programme period 2007-2013, that subsidies for the management of traditional agricultural biotopes and the establishment of wetlands with multiple impacts should be made available to registered associations as well as farmers, represents a significant step forward in the context of safeguarding agricultural biodiversity. The survival of traditional agricultural biotopes is dependent on their grazing or other forms of active management. The number of such areas currently covered by management agreements is insufficient to guarantee the survival of their characteristic species, their ecological diversity or their regional features.

Objectives

The conservation and management of agricultural biodiversity should remain a key priority of multifunctional agriculture.

More efforts should be made to safeguard the continued management of traditional agricultural biotopes and the plant and animal species that depend on them. The declining trend in biodiversity in conventional farmland should be halted as the priority objective of this part of the Action Plan. In the planning of cultivation, consideration should be given to the importance of farmland habitats for other ecosystems.

Measures

17) Agricultural strategies, policies and practices that preserve and promote biodiversity will be further developed, through various means including the agrienvironmental support scheme.

- MAF and MEnv, 2007-2013

18) Advice, training and research will be intensified so as to promote the management of biodiversity and the landscape in agriculture.

- MAF and MEnv, 2007-2013

19) The preservation of the habitats and routes used by farmland species will be safeguarded through agrienvironmental measures.

- MAF, 2007-2013

20) Designations of High Nature Value (HNV) farmland areas will be completed, and their future management guaranteed through their inclusion in the agrienvironmental subsidies scheme.

- MAF, 2007-2013

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.

- MAF, 2007-2013

Game animals and stocks

Background

In Finland landowners have the right to hunt and control hunting on their land. There were around 300,000 registered hunters across the country in 2004. Registered hunters pay an annual game management fee. Game stocks are controlled in Finland by defining specific hunting seasons and catch quotas. The Ministry of Agriculture and Forestry annually sets maximum permissible catches and regional quotas for certain game species, so as to ensure that each species is hunted according to the principle of sustainable use defined in the Hunting Act, and the EU Habitats and Birds Directives. Quotas are set for game species including wolf, brown bear, otter, lynx, Baltic ringed seal, grey seal and various game birds. Game habitats are improved through game management measures carried out by hunting clubs and other associations.

Current situation

Land use changes, hunting practices, and especially changes in farming and forestry practices have all affected game species' habitats and numbers. The red list survey of threatened species in Finland (2000) showed that wolverines and wolves are endangered. Game species classified as near threatened include European beaver, brown bear, polecat, lynx, Baltic ringed seal, grey seal, wild forest reindeer, bean goose, black grouse, capercaillie and partridge.

Many game species that were originally not native to Finland have become well established in the wild. Examples include Canadian beaver, raccoon dog, Canada goose, American mink, whitetailed deer, fallow deer, pheasant, muskrat and mouflon. This issue is considered in Finnish legislation. Section 42 of the Hunting Act prohibits any imports or releases into the wild of nonnative bird or mammal species or populations conducted without official permission from the Ministry of Agriculture and Forestry. Current trends in the populations of game species vary for different species groups. Species found in oldgrowth forests are generally declining, while species that thrive in younger forests have typically become more common. The regulation of hunting and changes in hunting methods have affected the populations of many game species. Species currently increasing in numbers include roe deer, all the large carnivores, seals, otter, and smaller predatory mammals. Elk numbers have remained more or less stable in recent years. Populations of the most widely hunted game birds have remained fairly low, although there is evidence of some upward trends in recent years. Population trends for bean goose, partridge and garganey seem to be affected by factors not yet understood. In other cases, current levels of exploitation of game stocks can generally be maintained without endangering the species concerned.

Game abundance indexes can be used to describe the numbers and diversity of game species in each area. These indexes reveal that game bird populations such as those of black grouse have declined steeply, while the numbers of many small predatory mammals have increased.

Challenges

Changes in land use, farming and forestry have greatly affected the habitats of game species. Features that provide shelter for game species have virtually disappeared from farmland, and also declined in forests. This trend represents a significant threat in particular for game birds.

The spread of exotic species can lead to changes in the diversity of game species. Competition or crossbreeding with nonnative populations may weaken native populations. This is the case where Canadian beavers hinder the recovery of European beaver populations, for instance. Exotic species may also bring or spread new diseases and parasites. Diseases and parasites such as bird flu, rabies, tapeworms and the 'rabbit fever' tularemia can spread through game stocks.

Increasing numbers of large carnivores and seals and their socio-economic impacts pose additional challenges in the context of balancing hunting and species conservation. The implementation of the EU Habitats Directive in Finland has proven somewhat problematic concerning requirements to protect large carnivores.

Large carnivores cause damage to domestic animals and reindeer herders' livestock. Elk cause damage in commercially managed forests, gardens and farms, and are also often involved in serious road accidents. These various types of damage must be considered when decisions are made on the management of these species stocks.

Objectives

Hunting should be practised according to the principle of sustainable use, to ensure that game species' populations do not become endangered or suffer from disturbance to their behaviour patterns and natural dynamics. The levels of damage caused by game animal species should be kept down to acceptable levels by regulating the stocks of certain species through hunting, and with the help of preventive measures. Game habitats in forests, farmland and waters should be improved and safeguarded.

Measures

- 22)** The habitats, natural behaviour patterns and annual cycles of game species will be safeguarded. • MAF and MEnv, 2006-2016
- 23)** Game population management plans will be drawn up and implemented for game species that are significant in conservational or socio-economic terms. • MAF and MEnv, 2006-2016
- 24)** The monitoring of game stocks will be intensified, and the resultant data used to ensure stocks are sustainably used and managed. The harmful impacts of non-native game species on native stocks and ecosystems will be limited through game management measures. The import and release of new non-native game species and stocks will be prevented. Care will be taken to ensure the genetic suitability of any other introduced game stocks. • MAF, 2006-2016
- 25)** Damage caused by game species in the contexts of forestry, farming and road safety will be limited through preventive measures such as fences, green bridges and underpasses, repellents and artificial salt licks. A new compensation system will be set up for damage caused by game animals. • MAF and MTI, 2006-2016

The Baltic Sea and its shores

Background

Finland's National Programme for the Protection of the Baltic Sea, launched by the Government in 2004, aims to ensure that marine waters are in a good ecological state. This involves the preservation of regionally and biologically representative marine and coastal ecosystems, measures to reduce threats to natural marine ecosystems, and the conservation of the habitats of threatened species and species in need of special protection. The national Programme also aims to restore and manage marine habitats, and to reduce the harmful impacts of invasive alien species.

Finland has actively implemented the marine environmental protection conventions covering the Baltic Sea (HELCOM) and the NE Atlantic (OSPAR). A joint OSPAR-HELCOM ministerial meeting in 2003 set a target for the establishment of an ecologically coherent network of marine protected areas across the Baltic and the NE Atlantic by 2010. The network aims to conserve threatened and declining marine habitats and species, also considering the objectives defined for the EU's Natura 2000 network. The EU is currently preparing a marine strategy directive. Finland has also signed the ballast water convention of the International Maritime Organization (IMO), which aims to prevent the spread of harmful invasive alien species in ships' ballast water.

At a HELCOM meeting in 2006 new recommendations were issued covering seal populations in the Baltic (HELCOM recommendation 27-28/2). A recovery pro-

programme for the Baltic's porpoises was approved in 2002, to be implemented in connection with a related EU regulation (8121/2004).

Finland has prepared a national strategy in line with an EU recommendation on Integrated Coastal Zone Management (ICZM). A progress report on the implementation of the recommendation was submitted to the European Commission in spring 2006.

Current situation

Efforts to protect the Baltic Sea have borne some fruit over the years, even though the marine environment still faces various threats. Pollutant loads have declined, including those of hazardous substances such as DDT, PCB and mercury. Populations of whitetailed eagles and seals have begun to recover thanks to conservation measures. Progress has also been made on the conservation of coastal and marine biodiversity in Finland through the Natura 2000 programme. Finland's Natura 2000 network includes many areas important for coastal and marine biotopes and species. Several marine and coastal protected areas have been established, including four national parks, several more protected areas in State-owned waters and lands, and also protected areas on private land. In 1998, when most of Finland's Natura 2000 network was approved, the Government resolved that 22 of the network's marine areas would also be nominated for the Baltic Sea Protected Areas (BSPA) network of the Helsinki Convention on the protection of the Baltic marine environment (HELCOM). Finland has also participated in an evaluation of Baltic coastal and marine protected areas,

The CBD's programme of work on marine and coastal biodiversity

The programme of work on marine and coastal biodiversity (Decision VII/5) has five key programme elements: integrated marine and coastal area management, the sustainable use of marine and coastal living resources, marine and coastal protected areas, mariculture, and invasive alien species. The programme of work is based on the Jakarta Mandate on Marine and Coastal Biological Diversity – a programme of action adopted in 1995 at the second Conference of Parties to the CBD.

The programme of work aims to support the implementation of the Jakarta mandate at national, regional and global levels. It identifies key operational objectives and suggested activities within the five key programme elements mentioned above.

A key objective of the programme of work is to promote the establishment and effective management of marine and coastal protected areas defined on the basis of ecological data. The aim is to establish a global network of marine and coastal protected areas by 2012 building upon national and regional systems of protected areas.

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and the creation of general guidelines for management plans. Seal conservation areas have been established according to HELCOM recommendations, the monitoring of seal populations has been intensified, and data on threatened marine biotopes has been collected through underwater ecological inventories. Finland is preparing its own element of the Baltic porpoise conservation plan. Plans are also being prepared for the management of grey seal and Baltic ringed seal populations.

Challenges

The CBD's programme of work on marine and coastal biodiversity (2004) aims to promote the integrated management of marine and coastal areas, the sustainable use of marine and coastal resources, and the effective management of protected areas. Finland needs to set up an ecologically coherent network of effectively managed marine protected areas together with the other Baltic coastal countries by 2012. The CBD's programme of work also includes objectives related to invasive alien species, mariculture and genetic diversity. Finland has not yet assessed in detail which kinds of new measures will be needed in the context of the programme of work in addition to current and already defined schemes.

The lack of information on marine biodiversity and the insufficiency of data on regionally, locally and species-specifically ecologically significant areas represents the most critical hindrance to the sustainable use of marine and coastal areas. The planning of coastal areas in accordance with the principle of sustainable development, as required by the ICZM, requires extensive accurate

data on underwater conditions, as well as coastal areas. Accurate data on submarine biotopes and species is also needed in order to define the conservation statuses of marine biotopes and the need for further measures.

To produce such data, the Ministry of the Environment launched in 2004 the Finnish Inventory Programme for the Underwater Marine Environment (VELMU), which is being conducted in cooperation with other organisations within the environmental administration, other ministries, Metsähallitus, universities, research institutes, nongovernmental organisations and stakeholders' associations. The status of marine and coastal biotopes is also being assessed as part of a national scheme for the evaluation of threatened biotopes.

Objectives

In accordance with Finland's National Programme for the Protection of the Baltic Sea (2004), a favourable conservation status should be achieved for regionally and biologically representative coastal and marine ecosystems. The ecological state of marine waters should also be restored outside protected areas towards natural conditions by reducing the harmful impacts of eutrophication and activities such as construction and dredging. The representativeness of the network of marine protected areas should be urgently evaluated with regard to the marine biotopes and species found in Finland's exclusive economic zone, to ensure that enough data is available to assess the need for Natura 2000 sites in this zone.

Measures

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.

• MEnv, MFA, MEd, MAF, MTC, MTI, 2006-2016

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.

• MEnv, MFA, MEd, MAF, MTC, MTI, 2006-2016

28) Finland's coastal biodiversity will be assessed by completing the VELMU Inventory Programme for the Underwater Marine Environment by 2014. • MEnv, MI, MD, MEd, MAF, MTC, MTI, 2006-2014

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.

• MEnv, MAF, MTC, 2006-2008

Arctic habitats and reindeer husbandry

Background

Finland's arctic habitats are unique when compared to habitats elsewhere in the circumpolar zone north of the Arctic Circle. In places treeless fells rise straight out of forests and mires. Their vegetation type changes to sub-orohemiarctic at higher altitudes. In other parts of the world at similar northern latitudes the most typical habitats are arctic tundra or tundra forests dominated by Siberian spruce and larch. The mountain birch woodlands of Northern Finnish Lapland are also exceptional. In Finland, arctic vegetation communities occur to a considerable extent in isolated patches, and the tree line shifts constantly according to climatic variations, natural or otherwise. The combination of mires and forests found in Northern Finland is also untypical of the circumpolar zone. Coniferous forests grow exceptionally far north. The ecosystems of Finland's aapa mires and palsa mires are in many respects unique. These special features are well represented in the protected areas network of northernmost Finland. Climate change represents a significant longterm threat to such ecosystems, however, and it is important to prepare to deal with the likely impacts.

Finland's arctic fell regions are also unique in that they are actively used, most notably for reindeer herding and tourism. Traces of human activity can therefore be seen widely. Farming and forestry are also practised much further north in Finland than in other areas at com-

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parable latitudes. Reindeer husbandry is practised across Northern Finland almost throughout Lapland Province and in many parts of Oulu province, across an area that covers about 36% of the whole country in total. Reindeer are also kept on a small scale in other regions, as domestic animals.

The Stateowned lands in the northernmost parts of the reindeer husbandry region are particularly reserved for reindeer herding, and these lands cannot be used in ways that would have considerable negative impacts on reindeer husbandry. Reindeer densities are highest in the north with respect to total land areas, but in the south when compared to the total areas of lichen pasture where they can feed. Densities vary considerably between different reindeer husbandry districts. In the Sámi Homeland in the far north, reindeer herding has a special significance as the basis for the traditional lifestyles and cultures of the indigenous Sámi people. People have only been able to settle in these northerly lands thanks to reindeer husbandry. Today the presence of reindeer in the region is also important for tourism.

Reindeer herding practices are based on the ability of reindeer to find food for themselves in the natural environment. The maximum numbers of reindeer that can be kept in each husbandry district have been largely determined by the extents and productivity of their local lichen pastures. Due to problems with the rotation of lichen pastures, together with increasing numbers of reindeer, reindeer pastures are in poor condition in many areas today. The Ministry of Agriculture and Forestry regulates reindeer numbers for 10-year periods, to ensure that winter lichen pastures are not exploited beyond their carrying

capacity. At present the maximum number of reindeer that may be kept across the country is 203,700 (as defined in 2000).

Current situation

Most of Finland's arctic natural environments are protected to some degree, in officially designated wilderness areas or protected areas of various types. Almost all areas are affected to some extent by reindeer herding, tourism and other recreational activities, however. Mining, road building and tourist developments have led to considerable impacts on a local scale. But in general the impacts of these activities on the conservation and sustainable use of biodiversity remain well under control, thanks to legislation controlling reindeer husbandry, environmental impact assessments and management planning in protected areas.

The monitoring of reindeer lichen pasture has shown that intensive grazing leads to a decline in the species diversity of vegetation in forest and tundra ecosystems (especially for lichens), problems with the regeneration of forests (particularly birch woods), and declines in mycorrhizal fungi and soil organisms.

Inventories of reindeer pastures have shown that the areas of oldgrowth forest with plentiful horsetail lichen growing on spruces or pines have declined most clearly in herding districts where intensive forestry is also practised. Such forests are an important source of food for reindeer, especially in late winter, when it is hard for reindeer to dig out ground lichens from under the heavy snow. The remaining horsetail lichen pastures are particu-

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larly important in central and southern parts of the reindeer husbandry region, where lichen pastures are less widespread than in more northerly districts.

The maximum permissible numbers of reindeer and the levels of reindeer herding resulting in optimal productivity are largely dependent on the sustainable use of lichen pastures. Even though inventories have shown that lichen pastures can recover fairly rapidly, and that conditions in pastures have improved thanks to controls over rotation cycles and reindeer numbers, pastures are still generally in a relatively poor condition. The impacts of forestry on ground lichen pastures and the abundance of horsetail lichens are considerable and long lasting.

Challenges

Evidence suggests that climate change is occurring most rapidly in northern regions. For the biotopes and species of Finland's arctic fells, climate change represents a serious risk of at least local extinction, as tree lines move ever higher up the hillsides, and frost and snow conditions change. The melting of the permafrost inside palsa mires is a dramatic example of the effects of climatic warming. Climate change is an extremely serious threat to entire ecosystems and adapting to its impacts is a great challenge in the context of traditional local livelihoods, as well as in nature conservation. It is as yet uncertain how reindeer herding practices can be adapted, although it is clear that the risks associated with this livelihood will increase.

Lichen pastures have deteriorated due to grazing pressure and intensive forestry. Research data is needed

to enable land use planners, reindeer herders and other economic actors to ensure the ecological, economic and social sustainability of reindeer herding and other activities.

The economic viability of reindeer herding has declined, partly due to the lower prices paid to herders for reindeer meat, and this may also affect the levels of grazing pressure. Other factors affecting profitability include the need for additional fodder, losses due to road accidents and natural predation, and the damages caused by reindeer to crop fields.

Reindeer husbandry has a special cultural significance in the Sámi Homeland, and the need to safeguard this traditional livelihood must particularly be given due consideration when other land uses are planned in this region.

Objectives

Preparations should be made to deal with the consequences of climate change in northern ecosystems, through research, monitoring, and the development of adaptation strategies for local livelihoods.

The state of lichen pastures should be improved by reducing grazing pressure. Forestry practices should be identified that enable horsetail lichens and other vegetation vital to reindeer to survive better in forest stands from one tree generation to the next.

Measures

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 harmonisation of various land use interests.

• MEnv, 2006-2016

31) Reindeer herding and lichen pasture rotation practices will be further developed in co-operation with the reindeer herding 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. • MAF, 2006-2016

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 Sámi Homeland, steps will be taken to safeguard the traditional freeranging grazing of rotation pastures, which forms the basis of local Sámi culture.

• MAF, 2006-2016

Geological formations and biodiversity

Background

The geological diversity of rocks and landforms, or geodiversity, greatly shapes the vegetation and other ecological aspects of any area. Although the CBD does not directly address the protection of geodiversity, it is important to be aware of the crucial importance of the characteristics of rocks and soils in terms of the conservation of biodiversity. Any use of the soil, rock, minerals, ores or other materials in the ground can change the natural environment radically, and possibly also reduce biodiversity.

The protection of geological formations in Finland is largely based on the Nature Conservation Act and the Land Extraction Act. Smaller geological features may be protected under the Nature Conservation Act as 'natural monuments'. To assess and safeguard Finland's geodiversity, the environmental administration has together with expert institutions conducted a survey and evaluation of geological formations around the country. Finland's most valuable eskers were already surveyed in the 1970s. Surveys of rocky areas and moraine formations have largely been completed. An inventory of smaller geological features has also been conducted. A survey of windblown features and shoreline deposits was commenced in 2005.

Current situation

Gravel, sand and minerals extracted from the bedrock are Finland's most widely used nonrenewable resources. Their total consumption rate is equivalent to 17 tonnes of material per capita. The largest quantities of materials are used in road construction and maintenance, and housing developments.

Eskers and marginal moraine formations made of sandy and gravelly deposits are a central element of Finland's natural landscapes. Such features cover about five percent of the whole country. A further 13% of Finland's surface area consists of exposed or thinly covered bedrock. Untouched natural sand and gravel formations are becoming increasingly scarce. Sand and gravel extraction and construction have widely destroyed natural esker landscapes, especially near larger cities. In recent years rocks and stones have been more widely used in construction instead of natural sand and gravel, thus reducing the pressure on esker formations. Since the 1950s some 20,000–30,000 sand and gravel extraction sites have been set up across Finland, as well as more than 1,100 rock quarries. About 6,000 sand and gravel extraction permits remain valid today, as well as 1,000 quarrying permits and 500 permits for other types of mineral extraction.

A national esker conservation programme aiming to protect the natural diversity of Finland's esker landscapes was launched by the Government in 1984. The programme includes 159 eskers with a total area of 97,000 hectares, aiming to preserve their natural geological, geomorphological and landscape features. These areas' natural state and landscapes cannot be disturbed

by extracting sand and gravel, for instance. Eskers are largely protected through legislation within the Land Extraction Act and Decree. In eskers within the conservation programme, controls are also usually necessary over construction and the location of roads and power lines. Many of the eskers and associated marginal moraine features protected in this programme also contain valuable habitats such as open, sunlit slopes, well-lit sandy and gravelly heaths, herb-rich esker woodlands, springs and streams. Such areas provide vital habitats for plants and animals that can only thrive in such conditions.

So far around 3,150 valuable rocky areas have been surveyed across Finland, of which 1,400 have been classified as nationally valuable. The national survey of rocky areas aims to list and classify the most valuable sites, and produce data to use in connection with permits granted under the Land Extraction Act. Surveys have been carried out by the Finnish Environment Institute together with the Geological Survey of Finland, covering all of Finland with the exceptions of northernmost Finland, the Åland Islands and the Baltic archipelago. The related fieldwork was completed in 2004. Rocky areas or individual features within them of value to biodiversity include areas with calcium-rich or ultra-alkaline rock types, and cliffs and steep rocky slopes associated with exceptional microclimates caused by shade or exposure to the sun.

Moraine formations are the most common geomorphological features in Finland. This category includes features that originated in various ways and have greatly differing forms and structures. So far some 1,400 moraine formation areas have been surveyed across Finland, of which 600 (with a total area of 58,000 ha) have been

designated as nationally valuable. The fieldwork for these surveys, which ended in 2005, has been conducted by the Finnish Environment Institute together with the Geological Survey of Finland, aiming to establish a single classification system for moraine features and complexes. The resultant information is also useful when applications for mineral extraction permits are considered, and for the purposes of land use planning. Increases in construction and the use of minerals have added to the pressure to exploit moraine formations particularly in areas where less sand and gravel is now extracted from eskers. Moraine formations are associated with the same types of ecological values as rocky areas and eskers, including sunlit slopes, open habitats, shady slopes, and nutrient-rich soils providing growth sites for herb-rich woodlands or fens.

A survey that commenced in 2005 aims to identify and classify Finland's most valuable windblown formations and shoreline depositional features. The survey data is also needed for permit procedures under the Land Extraction Act, and for other land use planning. The survey is being conducted by the Finnish Environment Institute together with the Geological Survey of Finland. Windblown features and shore deposits have ecological value as the habitats of threatened species, as well as geological and landscape values. Many include biotopes listed in the Nature Conservation Act and the Habitats Directive, or habitats of special importance specified in the Forest Act. The most important windblown features for biodiversity are dunes, which along coasts are associated with many special habitats and species that are threatened or rare in Finland. Dunes in inland locations are also valuable

because their sunlit slopes host various demanding vegetation communities and their associated species. Shoreline deposits exhibit many similar features. Depositional features alongside large rivers are particularly significant, since they may contain plant and animal species that have naturally spread along river valleys into areas outside their present core distributions.

Challenges

Finland's Land Extraction Act aims to ensure that materials are extracted so as to support environmentally sustainable development, landscape values and biodiversity. To meet these goals, more information is needed about the natural values of rock formations and landforms and about the groundwater they contain, as well as about the quantities, qualities and usage of any exploitable minerals.

Finland's current mining legislation has become outdated, and gives very little consideration to biodiversity. Such legislative deficiencies continuously give rise to conflicts in areas where natural values are recognised, but current legislation enables their significance to be ignored. Mining activity has intensified in Finland as markets have opened up and mineral prospecting has become more effective. Restrictions related to the need to conserve biodiversity are also of interest to international mining companies.

Objectives

Minerals can only be extracted in line with environmentally sustainable development if enough information is available about the quantities, qualities and usage of reserves of minerals and groundwater, as well as the related environmental conditions and natural values.

A prime objective in the ecologically sustainable use of minerals is to reduce the use of virgin resources.

The effectiveness of the permit system defined in the Land Extraction Act in protecting biodiversity depends on how well areas of high conservation value are known.

The Mining Act should be completely revised for many reasons. Environmental impact assessment and permit procedures should be clearly defined in these legislative changes, to ensure that features of irreplaceable conservation value are not lost.

Measures

33) Land use planning and research will be intensified to support the sustainable use of minerals. • MEnv, 2006-2016

34) Inventories of geological formations will be concluded, with the resultant data made easily available to the authorities, planners and the users of mineral resources. • MEnv, 2006-2009

35) A mineral auditing scheme will be implemented according to the objectives of the sustainable use of minerals. • MEnv and MTI, 2006-2010

Urban and built-up areas

Background

Settlement in Finland is concentrated in built-up communities. Almost 80% of the Finnish population today live in towns and cities, and the longterm urbanisation trend has accelerated since Finland joined the EU in 1995. Remote rural areas are undergoing depopulation, and urban communities are growing. The Finnish population is becoming increasingly concentrated in an ever smaller region in the urbanised south and southwest of the country, where biodiversity is also highest. The habitats and species found in urban areas are affected by increasingly intensive land use patterns and other environmental pressures on urban areas.

Natural features characteristic of the historic settings of Finland's towns and cities have been widely preserved, even in the central areas of larger cities. Areas of reasonably wellpreserved natural coastal habitat, esker landscapes, rocky habitat, riverside settings, lakes and islands can be found within many urban areas. Towns and cities are also home to species that have adapted to thrive in various types of environment created by man. Many such species were earlier typical of natural areas in the early stages of ecological succession. These species are today very scarce in the countryside and are primarily associated with built-up cultural environments.

Current situation

In urban areas, natural habitats have been fragmented into ever smaller patches as more areas are built up, with their connections to natural areas in the surroundings weakened or completely broken. There is a risk that the vital connections and exchanges of species between green areas within towns and cities and more natural areas in their surroundings will be lost. Such links have been a characteristic feature of urban ecology in Finland in the past. The remaining islands of natural habitat in towns and cities are invariably used by local residents for recreational activities. Recent research has proven that citydwellers appreciate the proximity of extensive seminatural green areas, and feel that it is important that such areas remain undeveloped.

Infill developments are currently the vogue in urban and regional planning in Finland, with the aim being to make urban areas more sustainable by intensifying the use of community structures and existing urban infrastructures. Such planning involves intensified construction in builtup areas, the filling in of gaps, and the use of areas formerly occupied by industry, harbours or rail goods terminals for new construction. One key objective is to reduce the need for transportation, and thus also energy consumption. The need to preserve biodiversity has not been given enough consideration in such developments, however.

Nature reserves and biotopes in need of special protection have been designated to protect nature within many urban and builtup areas. Many towns and cities include sites within the Natura 2000 network. Forest habitats classed as particularly important under the Forest

Act are considered in municipal forest planning. A special working group set up under the METSO Programme has defined new ways to safeguard biodiversity in municipal recreational forests. Three national urban parks have already been established under the Land Use and Building Act. All three contain nationally and regionally valuable natural areas and Natura 2000 sites. Such urban parks reinforce 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.

Challenges

Legislative tools for slowing the decline of urban biodiversity already exist. Not enough is known about the special features of urban habitats and the threatened status of their species to enable an accurate assessment of their importance in the context of the conservation of biodiversity. Research into urban nature has progressed rapidly in recent years on an international scale, and research results are already being applied in practice. Such research and applications conducted elsewhere cannot generally be applied directly to urban environments in Finland, however, and there is a need for research focussing on issues related specifically to the biodiversity of urban environments in Finland. The concept of the national urban park can be a useful tool for sustainable urban planning, with the aim being to preserve both natural and cultural heritage in extensive and coherent areas.

Objectives

More information should be collected and compiled about the biodiversity of urban environments, and made more available for the purposes of land use planning, decision-making and monitoring changes. There is also a need to improve planning processes so that they give due consideration to the need to preserve and safeguard urban biodiversity, and to slow the fragmentation and isolation of natural areas through the careful planning of land use patterns and networks of urban green areas. Finland's network of national urban parks should be expanded and used in the testing of good practices. Environmental education related to urban ecology and its importance for both people and nature should also be increased.

Measures

36) A programme of research, publicity and planning related to the conservation biology 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. • MEnv, MI, MEd, MAF, 2008-2010

37) The national urban parks network will be extended.
• MEnv, 2006-2016

Open habitats

Background

Various types of open, treeless and low-vegetation habitats have declined considerably in Finland, for reasons including the overgrowth of shores due to eutrophication, the end of grazing, effective forest fire prevention, and the eutrophication effects of airborne nitrogen deposition. Many ecologically unique habitats such as sandy shores and dunes, sunlit esker slopes and dry meadows have declined, and many species dependent on such habitats are increasingly threatened.

Today many of the species naturally associated with such open habitats are increasingly taking refuge in a variety of artificial open environments created by man. Such habitats including road and railway verges, airfields, sand-pits, quarries, clearings along power lines, military areas, loading areas and ruderal areas – areas of unused open land, usually in the vicinity of buildings. Such areas are particularly important for many insects, including butterflies, beetles, Hymenoptera and Diptera. Many plants and fungi also thrive in such habitats.

The benefits for biodiversity of such artificial habitats vary greatly, depending on how they are managed. Open derelict lands in particular may only persist temporarily unless they are actively managed, but if they are purposefully maintained they can be very important for the survival and dispersal of many species.

Current situation

There is not yet a detailed knowledge base about the occurrence and state of remaining valuable sunlit esker slopes, sandy shores and dunes, or the need for their management. This hinders the effective channelling of resources. There is also a lack of information on the distribution of artificial open habitats of importance for biodiversity. In 2006 a joint project was launched to examine the current state and management of sunlit esker slopes, involving the Finnish Environment Institute, the Forestry Development Centre Tapio, Metsähallitus, UPM-Kymmene, Helsinki University and regional forestry centres. This wideranging cooperation enables the combination of expertise on forestry and environmental issues. The project aims to define new methods for the monitoring, inventorying and management of sunlit habitats. The project will assess the current state and biological values of sunlit esker slopes. Conditions for their characteristic species can be improved through various measures, including controlled burnings and the carefully planned thinning out of trees. Monitoring work is to commence in several sites in both commercially managed forests and protected areas. The project will be implemented during the period 2006-2008.

Artificial open habitats are often more widespread than natural open habitats or open habitats created by traditional grazing practices. Roadside verges around Finland with a total area of more than 161,000 ha, about fifty times larger than the total extent of remaining ecologically valuable meadowlands, are regularly mown. Since their habitat conditions are broadly similar to traditionally mown meadows, these roadside verge habitats can to some ex-

tent compensate for the scarcity of traditional meadowlands. Some roadside habitats are already known to be diverse and ecologically valuable. The numbers of such valuable areas could be increased if more were known about the best ways to maintain them to benefit nature as well as road users.

For meadowland species, the greatest risks related to roadside habitats concern the timing of mowing, and the fact that the mown vegetation has not usually been removed. Modern mowing equipment is not very well suited to the management of meadowland species. Such problems have been addressed in a roadside nature management programme completed by the National Road Administration in 1999, which resulted in a set of guidelines on how to consider and promote biodiversity in connection with the management and maintenance of main roads. According to these guidelines, more detailed criteria for the quality of management work should be defined when management contracts are made. It is particularly important to clearly designate ecologically valuable roadside features and define specific measures to promote biodiversity.

Challenges

In natural open habitats and traditional agricultural biotopes protective measures will not alone suffice to preserve their natural values, if no measures are taken to limit their overgrowth. Efforts to combat eutrophication are slow to take effect, so sites must be actively managed and restored to enable natural processes to be reactivated or recreated.

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Where artificial open habitats have been created for other purposes, the authorities responsible for their management and maintenance are not always aware of their significance for biodiversity, and in many cases valuable sites have been inadvertently destroyed.

Objectives

The ongoing decline in natural and artificial open habitats and their species should be halted by purposefully improving their state and addressing the reasons behind their decline. More information should be built up about the occurrence and of state of valuable natural sunlit habitats and comparable artificial open habitats, and about favourable ways to manage and restore such habitats. Such habitats should be maintained and managed, so as to enable the preservation and spread of valuable species. An effective network of suitably managed and restored habitats should be developed to facilitate the movement and spread of species.

Measures

38) Natural sun-baked habitats and other open habitats of value for biodiversity will be surveyed. Investigations will be conducted to assess the extent to which various artificial open habitats such as road verges, clearings along power lines and derelict land can replace declining natural open habitats. • MEnv, MTC, MAF, 2006-2010

39) Together with various actors, measures will be devised to preserve and increase the features of open habitats of importance for biodiversity during their management and use. Guidelines for the management and restoration of natural sunlit habitats will be drawn up and implemented both inside and outside protected areas.

• MEnv, MTC, MAF, 2008-2010

40) Biodiversity will be more widely considered in the management of open areas associated with transport infrastructure. Guidelines defined in the National Road Administration's nature management programme (1999) will be followed together with any newly defined principles in the management of roadside verges and other roadside areas. The management of roadside verges, clearings for power lines and derelict land will be developed so as to provide suitable new habitats for species that thrive in open habitats. • MTC, MEnv, 2006-2016

Finland's network of protected areas

Background

Finland has 1,860 sites within the Natura 2000 network, with a total area of about 4.9 million hectares, about threequarters of which (3.6m ha) consist of terrestrial sites. Almost all of these sites (97%) were already protected as nationally designated nature reserves or within national conservation programmes or other such schemes. The European Commission has already given its final approval to almost all of Finland's proposed Natura 2000 sites.

When the national protected areas network, current conservation programmes and Natura 2000 network have been implemented, the various types of extensive or threatened natural areas as specified in the CBD's programme of work on protected areas will be largely protected in Finland. Finland's protected areas network is already representative in conservation biology terms in the north and the east. The needs of migratory species have also been duly considered as required under the Habitats and Birds Directives, particularly in the context of the establishment of the national Natura 2000 network.

Current situation

The effectiveness of the management of Finland's protected areas has been assessed by international evaluators twice, in 1994 and 2004. According to the most recent assessment, Finland's larger Stateowned protected areas

are generally well managed, and meet the objectives defined for them regarding the conservation of biodiversity.

The natural resource planning carried out by Metsähallitus effectively meets the aims of the programme of work in terms of the integrated use of land and natural resources in terrestrial ecosystems around protected areas, particularly in Northern Finland. Finland's active involvement in crossborder co-operation on protected areas has been internationally recognised in recent years.

Protected areas are important for the conservation of biodiversity, but they are also vital as settings for outdoor recreation, and as natural attractions in themselves. Finland's national parks' total annual visitor numbers have increased rapidly in recent years (358,000 in 1992; 832,000 in 2000; and 1,410,000 in 2005), and the parks have become highly significant for tourism at the regional and local level.

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 de-

The CBD's programme of work on protected areas

The CBD's programme of work on protected areas (Decision VII/28) consists of four interlinked programme elements, together with related goals, targets and schedules, as well as suggested activities to be decided on at national level.

The four elements cover:

- 1) the planning, establishment and management of protected area systems and sites
- 2) governance, participation, equity and benefit sharing
- 3) enabling activities
- 4) standards, assessments and monitoring

The programme of work is to be implemented in accordance with the ecosystem approach. The overall objective of the programme of work on protected areas is the establishment and maintenance of comprehensive, effectively managed, and ecologically representative national and regional systems of protected areas by 2010 for terrestrial areas and by 2012 for marine areas, contributing to a global network of protected areas. Another objective is that by 2015 all protected areas and protected area systems should be integrated into the wider landscape and seascape and relevant economic sectors by applying the ecosystem approach and taking into account ecological connectivity, and where appropriate the concept of ecological networks. This can be done through the establishment of ecological networks, corridors and buff-

er zones, and with the help of habitat restoration.

According to the programme of work, Parties to the CBD should urgently establish and expand protected areas in any large, intact, relatively unfragmented or highly irreplaceable natural areas, and in areas under high threat, while also safeguarding occurrences of the most threatened species. Parties are also required to conduct gap analyses of protected areas networks (terrestrial, inland waters and marine), and designate new protected areas to fill in these gaps by 2009.

The role of protected areas as a part of wider ecological entities and functions should be strengthened. The programme of work encourages the establishment of transboundary protected areas as well as intensified crossborder cooperation between neighbouring protected areas. The most serious threats facing protected areas (e.g. eutrophication, overgrowth, harmful invasive alien species, climate change) should be assessed, prevented and mitigated.

Parties should also ensure by 2008 that sufficient financial, technical and other resources are available to effectively implement and manage their protected areas. Parties must also monitor and assess the current state of and trends in their protected areas.

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pendent 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.

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. During the period of this Action Plan the network of protected areas will be extended mainly through voluntary conservation methods.

Objectives

Finland should have a comprehensive, effectively managed, ecologically functional and representative network of protected areas made up of regional and national systems. This network should also form an integral part of the global network of protected areas envisaged in the CBD.

Measures

41) Conservation measures will be implemented by 2012 in areas within the Natura 2000 network to meet the objectives set out in the Habitats Directive. Where necessary, management plans will be drawn up together with stakeholders. • MEnv and MAF, 2006-2012

42) The effectiveness of the management and maintenance of Finland's protected areas network will be improved, especially in terms of the management of species and biotopes. • MEnv, 2006-2012

43) The ecological functioning and connectivity of the Natura 2000 network will be enhanced where the areas so far protected do not sufficiently ensure the conservation of species. This can be done under the

Nature Conservation Act, through regional land use planning, through natural resource planning in stateowned lands, and by favourably channelling environmental subsidies for forestry and agriculture with regard to conservation needs. • MEnv, MAF, 2006-2016

44) Opportunities for employment and business related to protected areas will be promoted through the implementation of the government approved programme for developing nature tourism and recreational activities in natural areas (VILMAT). • MEnv, ML, 2006-2010

Restoring and maintaining natural habitats

Background

Habitat restoration work is carried out to speed the recovery of ecosystems affected by man towards their natural state. Methods employed in forests include controlled burning, the creation of small clearings, and deliberately damaging trees to promote their decay. Such measures are designed to recreate the original structural features of natural forests. In mires, the main aim is to restore natural hydrological conditions, which then allows their natural processes to become reestablished. Wetland restoration methods include the raising of water levels, the excavation of areas of open water, and the reintroduction of grazing in shore meadows. Habitat restoration and rehabilitation are important tools for slowing the ongoing decline in biodiversity. Habitat restoration and management measures are needed to improve the effectiveness of the protected areas network. There is also an increasing need to restore habitats to safeguard viable populations of threatened and declining species.

Current situation

Forest and mire habitats have been restored in protected areas in Finland for more than a decade. Some 143,000 ha of mire habitat previously drained for the purposes of forestry had been restored by the end of 2005. By the end of 2005 about 6,000 ha of forest habitat had been restored, mainly in protected areas in Central and South-

ern Finland. Smaller areas of habitat have also been restored in protected areas on private land in various parts of the country, on a piecemeal basis. In nature management projects conducted according to the Act on the Financing of Sustainable Forestry, a total area of just over 100 hectares of mire habitat has been restored in private commercially managed forests. It has been estimated that wetland habitat restoration and management measures are needed in 162 Natura 2000 sites. Such work has so far been initiated in 55 sites.

Challenge

Metsähallitus plans to restore a total of 22,000 ha of mire and forest habitat in protected areas in Southern Finland, western parts of Oulu Province and SW Lapland over the period 2007-2012. The need for such habitat restoration work is particularly great in wetland mires and threatened forest biotopes. Monitoring of the impacts of these measures has not yet been fully organised.

Objectives

Habitat restoration work should be planned and carried out on a local and regional scale to ensure that it increases the ecological value of protected areas, and supports the development of an ecologically functioning network of protected areas. Monitoring methods should be devised for restored habitats, and a monitoring network should be established and maintained covering restored mire and forest habitats in Stateowned protected areas. Measures to restore the natural state should also be initiated in pro-

tected areas on private land where necessary. Forest habitat restoration methods should be improved to make them also applicable in commercially managed forests. Typical wetland species and biotopes should be safeguarded, and the survival of viable populations of threatened species should be ensured.

Measures

45) Methods will be devised for monitoring the impacts of habitat restoration, and a monitoring network will be set up covering restored forest and mire habitats in stateowned protected areas. Data systems will be developed to store the resultant data. • MEnv, 2008-2010

Threatened biotopes

Background

Biotopes are a key element of biodiversity. They have a value in their own right in terms of the preservation of biodiversity, but their role as species' habitats is also highly significant. Many biotopes have declined in Finland, also threatening the survival of their characteristic species. Various laws and international agreements oblige Finland to protect and monitor biotopes.

Current situation

Finland's first survey of the threatened status of biotopes has been initiated, and will be completed during 2007.

Challenges

Biotopes have not been the focus of as much research and evaluation work as species, and there are considerable gaps in the overall picture of the state of Finland's biotopes and the need for their conservation. There are particularly deficiencies in information on the occurrences of rare biotopes. Data from ecological surveys carried out for different purposes has often been of varying quality and of little use for comparative purposes, since there have been no effective guidelines for the identification of noteworthy biotopes. Biotopes are not permanently stable, and many exhibit continuous processes of ecological succession. Losses of biodiversity are often due to the ways human activity inhibits or alters such natural processes.

Objectives

Declining trends in Finnish biotopes should be halted by improving the state of threatened biotopes, and by addressing the factors endangering them. A knowledge base should be built up to promote the conservation, management and restoration of biotopes, and to improve the related research and monitoring. Awareness of the significance of biotopes as a part of biodiversity in Finland should be increased, with identification guides produced to facilitate the collection of reliable and comparable data on biotopes.

Measures

46) An action plan will be drawn up and implemented to improve the state of threatened biotopes, on the basis of the results of the ongoing survey of the threatened status of biotopes in Finland.

- MEnv and MAF, 2008-2016



Species

Species protection

Background

In conserving biodiversity it is important to consider all species, in order to facilitate the observation of environmental changes, and predict any harmful impacts on species groups or species linked to certain habitat types.

Measures taken to protect threatened species are based on evaluations of the likelihood of their disappearance, as defined in their threatened status. Evaluations are carried out globally by the World Conservation Union (IUCN), whose conservation status categories and criteria are also applied in Finland.

National and regional targets for plant conservation may be developed within the flexible framework of the Global Strategy for Plant Conservation. A European Plant Conservation Strategy has also been developed on the basis of the global strategy, also aiming to complement it,

with objectives promoted through the Planta Europa network and its member organisations.

Current situation

Finland is one of the world's leading countries in the evaluation of species' conservation statuses. Finland's third major "red list" evaluation, conducted in 2000, assessed almost 19,000 species. Sufficient data was available to define the statuses of some 15,000 of these species. Similarly comprehensive evaluations have also been carried out in Sweden, the UK and Germany. Preparations for the fourth red list evaluation have already begun, involving 14 expert groups focussing on different species groups.

In 2000 a total of 1,505 species were categorised as threatened in Finland, 1,393 of which were proposed for listing in the related annex of the Nature Conservation Decree, including 592 species deemed to be in need of

The CBD's Global Strategy for Plant Conservation

The longterm objective of the CBD's Global Strategy for Plant Conservation (Decision VI/9) is to halt the current and continuing loss of plant biodiversity. The strategy also covers the sustainable use of plants and the equitable sharing of the benefits obtained from plant genetic resources. The strategy includes 16 global targets to be achieved by 2010, and also sets out a framework for the coordination of initiatives aimed at plant conservation, the identification of gaps where new initiatives are required, and the mobilisation of the necessary resources. National and/or regional targets for plant conservation may be developed within this flexible framework. The Global Strategy for Plant Conservation is the first such strategy set up under the CBD to include specific global targets.

special protection. This list in the annex was subsequently updated in 2005 on the basis of more recent information. Threatened species future survival in the wild in Finland is endangered. Species in need of special protection are particularly threatened with extinction in Finland, and special conservation measures are carried out under the Nature Conservation Act to safeguard their populations and promote their recovery.

Through the European Plant Conservation Strategy, Finland has been working towards several of the objectives of the Global Plant Conservation Strategy in various administrative spheres. The environmental administration has conducted assessments of the threatened statuses of plant species (in 1985, 1990 and 2000), and also widely

promoted the conservation, management and monitoring of plant species and their habitats. 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. The conservation, management and monitoring of plants and fungi and their habitats have also been widely promoted at regional and local level, without any overall plans at national level, however. During the years 2004-2005 the Finnish Environment Institute and Metsähallitus together compiled preliminary proposals for a set of national plant conservation objectives based on the international strategies mentioned above. Both organisations are also members of the Planta Europa network.

Challenges

There are still gaps in the information available on Finland's species and current trends in their occurrence. About 2/3 of all Finland's species were left out of the red list evaluation due to a lack of sufficient data. An ongoing research programme focussing on data-deficient and threatened species (PUTTE) is designed to improve this knowledge base, and it is hoped that the next red list survey could cover as many as half of Finland's species. To get the remaining species covered by future evaluations would require the continuation of this research programme beyond 2006. The production of new identification guides would allow amateur naturalists to contribute more to the monitoring of changes in species occurrences.

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Finland has not yet drafted a national action plan on plant conservation. To meet the goals, resources will have to be redirected into species protection and management in the environmental administration, into botanical museums, and in the administrative sphere of the Ministry of Agriculture and Forestry. More support would also be needed for communications, training and voluntary work. To ensure such efforts are properly directed, more information on the current occurrences of vascular plants, mosses, lichens and fungi requiring protection and monitoring needs to be compiled in the species section of the environmental administration's Hertta data system. The exchange of information between different actors must also be made more effective, and additional research is needed to generate suitable data for species-specific conservation and monitoring programmes and for habitat management guidelines. The general monitoring of species and habitats has not yet been organised. It is also important in the context of plant conservation to improve the quality and communication of data, and the effectiveness of data systems. Similar challenges exist for other species groups in Finland.

The global and European plant conservation strategies and Finland's plant conservation action plan will share many common features with the national action plan for the conservation of biodiversity in Finland, including conservation measures for various habitats, international responsibilities, and many crosscutting themes.

Conservation programmes would need to be drawn up for a total of some 500 threatened species in Finland, but so far it has only been possible to prepare such pro-

grammes for about 100 species. One way to conserve species in need of special protection is to designate areas where they occur for protection as specified under the Nature Conservation Act. But so far fewer than 50 such areas have been designated, even though estimates indicate that more than 1,000 such areas would be needed in all. The use of existing conservation methods has been limited due to the allocation of the conservation authorities' resources to more prioritised tasks.

It will only be possible to give threatened species due consideration in the use of natural areas outside protected areas if enough accurate, up-to-date and more comprehensive information becomes available on their occurrences. There are still considerable gaps in the relevant data.

Objectives

Knowledge of the current state of and trends in all species in Finland should be improved, with monitoring particularly enhanced for species in need of special monitoring. Declining trends should be halted, and species conservation statuses improved with the help of conservation and management measures. To promote species protection, a plan should be drafted to prioritise the proposed measures for species conservation, management, monitoring and research work. Implementation plans should then be drawn up, describing the resources required and allocating responsibility between various organisations. The conservation, management and monitoring of threatened species should be organised, with

knowledge built up through research and data compilation to ensure that the statuses of most of Finland's species can be reliably evaluated.

A national plant conservation action plan should be prepared and implemented on the basis of international strategies and national needs, to guide, prioritise and channel current plant conservation work to the most important areas with regard to the conservation and sustainable use of plant biodiversity. The ongoing declines in wild plants and their habitats should be halted by promoting favourable conservation, management, research, monitoring and communications measures.

Measures

47) Comprehensive evaluations of the threatened statuses of species in Finland will be carried out every ten years. The next such report will be published in 2010. • MEnv, MAF, MEd, 2006-2010, 2010-2016

48) An implementation programme for the conservation of species will be drafted, defining focal points for actions, resource objectives and priorities with schedules, also allocating responsibility for this work. Guidelines and recommendations will be issued to harmonise the guidance of plant conservation work. Opportunities to ease exceptional permit procedures in the context of species protection will be assessed. • MEnv, MAF, MEd, 2007-2008

49) The quality and usability of data on threatened species will be improved, with the help of inventories. Data systems covering species will be updated, and the exchange of information between different actors will be enhanced. • MEnv, MAF, MEd, 2006-2010

The Global Taxonomy Initiative and its implementation in Finland

Background

The Global Taxonomy Initiative aims to significantly increase the information available about global biodiversity, right down to the level of the genetic variations within populations. This increased information will be used to promote both nature conservation and the sustainable use of natural resources. The initiative particularly aims to promote projects designed to work towards the main objectives of the CBD.

When the programme of work was adopted, the need to co-ordinate its implementation with existing national, regional and global initiatives was stressed. One important initiative in this context is the Global Biodiversity Information Facility (GBIF). Capacity building at national and regional level was also seen as vital for the implementation of the programme of work.

Current situation

It has been realised in international forums that the science of taxonomy has not yet been developed sufficiently to meet the needs of species conservation. The classification systems currently used for species have even been described as outdated. Taxonomy has long suffered from a lack of public interest, research resources, and support from financiers. Students' choices and researcher training have consequently focussed more on other areas. This has also been true in Finland. Across large parts of

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the world the lack of basic knowledge prevents the effective planning of the sustainable use of biodiversity. Even though Finland is an international forerunner in terms of species conservation and evaluating the conservation statuses of species, very many of Finland's species have still not been adequately researched. Almost two-thirds of Finland's species are so poorly known that their conservation statuses cannot yet be evaluated.

In Finland the lack of trained taxonomists or museum workers specialised in the processing of species data hampers the monitoring and evaluation of changes in species. Research into the taxonomy of many invertebrates, algae and fungi has only progressed very slowly. The significant species data banks that do exist in Finland are themselves currently underused, due to administrative, economic and technical problems.

Some progress has been made since the last red list survey of threatened species was published in 2000, however, in the shape of the research programme PUTTE, which focuses on data-deficient and threatened species, and has been funded as part of the METSO forest biodiversity programme for Southern Finland. PUTTE has benefited from the most extensive funding ever allocated to taxonomical research in Finland. In Sweden a parallel research project, known as Svenska artprojektet, aims to identify all species living in Sweden, publish the consequent data, and train taxonomic researchers. Due to the biogeographical similarities and linkages between Finland and Sweden, and common traditions in the natural sciences, both countries should be able to benefit considerably from each other's research work.

The CBD's programme of work for the Global Taxonomy Initiative

The Global Taxonomy Initiative (GTI) was adopted by the CBD's 4th Conference of Parties (COP 4) in Bratislava in 1998 in recognition of the crucial importance of taxonomy in the conservation and sustainable use of genetic diversity. The CBD's programme of work for the Global Taxonomy Initiative (Decision VI/8) is based around five operational objectives:

- 1) to assess taxonomic needs and capacities at national, regional and global levels for the implementation of the CBD**
- 2) to help build and maintain the human resources, systems and infrastructure needed to obtain, collate, and curate the biological specimens that are the basis for taxonomic knowledge**
- 3) to facilitate an improved and effective infrastructure/ system for access to taxonomic information; primarily to ensure that countries of origin gain access to information concerning elements of their biodiversity**
- 4) to include key taxonomic objectives in the thematic work programmes of the CBD**
- 5) to include key taxonomic objectives in the crosscutting issues of the CBD**

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The Finnish Institute of Marine Research has within the co-operative framework of HELCOM built up an exceptionally high quality extensive taxonomic data base containing details of more than 2,000 phytoplankton species, subspecies and varieties.

The Finnish Museum of Natural History maintains national collections related to nature in Finland, and houses almost 9 million animal specimens, of which some 8.5 million are insects. The Botanical Museum's herbariums contain 3.2 million specimens, including 1.7m vascular plants, 0.6m bryophytes and 0.8m fungi. The Geological Museum has more than 100,000 samples of rocks and minerals, and the Botanic Garden contains more than 8,000 living plant specimens. Most of these specimens are of Finnish origin. The Finnish Museum of Natural History also maintains extensive archives of species observations made in Finland, consisting of some 20 million observations in all, including some dating back to the early 1800s. More than half of these observations concern birds. All of these collections and observations are vital for the purposes of research and investigations into changes in biodiversity in Finland. Almost as many specimens again can be found in other natural history museums around Finland. The botanical gardens of the University of Oulu, for instance, include a unique scientific collection of wild plants, and these living collections contain specimens of about a third of all plants found in the wild in Finland. The allocation of responsibility between the Finnish Museum of Natural History and museums around the country remains unclear, however.

Challenges

Most of the extensive collections of the Finnish Museum of Natural History are hard to use, since their details have not been stored in any electronic information system. The same is true of collections and records of species built up elsewhere in Finland over the last two centuries in other natural history museums and collections, which have never been compiled in easily usable form or harmonised with the information systems used by the environmental administration. There has been little or no progress with plans to convert such data into digital form.

The Finnish Museum of Natural History operates within the administrative sphere of the Ministry of Education, as part of the University of Helsinki. Although the Museum's connections to the University are useful in terms of the training of researchers and other such synergies, the University's current results management system is not well suited to museum operations. The Ministry of the Environment is a major user of the Museum's services, but it has not had any official role in guiding the Museum's operations. A natural partner for the Museum within the environmental administration is the Finnish Environment Institute. But the allocation of responsibilities between the two institutes remains unclear in some respects, and there are also deficiencies in the definition of common research objectives and the organisation of information and data exchanges. Experts on plankton mainly work at the Finnish Institute of Marine Research and Helsinki University.

ACTION PLAN SPECIES

Objectives

Taxonomic specimens should be collected, maintained and recorded so that all interested parties can use the resultant information. Taxonomic expertise should be safeguarded. Knowledge about Finland's species and their classification should be improved. Co-operation between the parties involved in research into species should be enhanced. The Finnish Museum of Natural History should meet Finland's obligations as defined under the Global Biodiversity Information Facility (GBIF).

Measures

50) The allocation of responsibilities between the Finnish Museum of Natural History and the Finnish Environment Institute will be clarified with regard to basic taxonomic research, the production and storage of data on specimens, and the monitoring of biodiversity. • MEd and MEnv, 2006-2007

51) The taxonomic data in the possession of the Finnish Museum of Natural History and the most important taxonomic data in regional natural history museums and collections will be digitalised. Processes for the updating and digital exchange of taxonomic catalogues of Finland's species will be jointly defined by all actors. • MEd, MEnv, 2008-2014

52) The implementation of the Global Taxonomy Initiative will be actively promoted, for instance by intensifying the training of Finnish experts, and the international exchange of experts. • MEd, 2007-2016

53) The current PUTTE research programme focussing on data-deficient and threatened species and species groups as part of the METSO forest biodiversity programme will be continued after 2007. Identification guides will be produced for Finland's species and most important species groups. National measures designed to improve knowledge and classification of species will be carried out in close co-operation with Sweden's Svenska artprojektet initiative. • MEnv, MAF, MEd, 2007-2012



The conservation and sustainable use of genetic diversity

The conservation and sustainable use of genetic diversity in agriculture and forestry

Background

Genetic resources in the context of crops, livestock and forest trees consist of the genetic diversity of the species concerned and all their races, breeds and varieties. Genetic resources of importance to Finland's agriculture, forestry and cultural heritage have adapted to local climatic, soil and landscape conditions over thousands of years, which makes them unique. Protecting these genetic resources safeguards the availability of genetic diversity for the purposes of agriculture, breeding and research, and for sustainable use by future generations. This diversity is particularly important in the contexts of livestock and plant breeding, and consequently Finland's food security.

International agreements and national genetic re-

source programmes aim to ensure that suitable plant varieties and animal breeds are available for agriculture and forestry also in the future. In addition to the CBD, the UN FAO's International Treaty on Plant Genetic Resources for Food and Agriculture (IT, 2004) defines globally binding legal frameworks for the preservation of genetic resources. The agreement has created a multilateral system based on access to plant genetic resources and the sharing of the benefits arising from their commercial and other uses between Parties to the Treaty. The FAO's Global Plan of Action (GPA) and Commission on Genetic Resources for Food and Agriculture (CGRFA) additionally oblige countries to draw up their own national action plans on genetic resources. The Finnish National Programme for Plant Genetic Resources for Agriculture and Forestry was launched in 2003, and the National Programme for Animal Genetic Resources in 2004. These programmes are monitored and developed by the Genetic Resources Committee, appointed by the Ministry of Agriculture and Forestry.

Current situation

Plant genetic resources

One important point to note when discussing plant genetic resources for agriculture is that commercial agriculture is practised further north in Finland than anywhere else in the world. 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 longerterm conservation of living seeds of barley, wheat, oats, rye and lawn grass for decades. The Nordic Gene Bank (NGB), located in Alnarp in Southern Sweden, 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). Agrifood Research Finland (MTT) and its networks provide most of the necessary facilities for such work in Finland.

The most natural way to conserve genetic resources is to cultivate plants in their original environment (in situ conservation). Landrace plant varieties and older commercial varieties can be conserved in their original cultivation environment on farms (in situ onfarm) and garden plants in private gardens (in situ on garden). Genetic resources can also be stored in a similar way to seeds and

field gene banks in slow growth conditions in laboratories or deep frozen in liquid nitrogen.

Animal genetic resources

Animal genetic resources are made up of the genetic diversity of individual animals and the breeds and varieties created over the millennia from animals originally obtained from the wild. Finland's landrace animal breeds were descended from the first domesticated animals brought here. The most threatened of the various Finnish landrace breeds and stocks include eastern Finnish cattle, northern Finnish Lapland cow, Kainuu grey sheep, Åland sheep, the workhorse breed of the Finnish cold blood horse, and the Finnish landrace hen.

The diversity and special characteristics of livestock breeds will be vital for future livestock breeding, as production conditions, breeding objectives and consumers' demands all vary over time. Maintaining different breeds will enable the development of new breeds and the exploitation of heterosis, the 'hybrid vigour' that improves the health and fertility of crossbred animals.

Animal genetic resources are conserved in live animals and in gene banks containing embryos and reproductive cell samples. The Nordic Gene Bank for Farm Animals (NGH), established in 1984, does not itself conserve genetic resources, but coordinates and spreads information to help administrators, animal breeders' organizations and rare breed conservation societies to ensure that the genetic variety of domesticated animal breeds is conserved.

Forest genetic resources

Forestry in Finland is based on local tree species. A network of gene reserve forests has been established to conserve forest genetic resources. This network is supplemented with conservation collections and conventional nature reserves. The conservation of forest trees' genetic resources forms part of the Finnish National Programme for Plant Genetic Resources for Agriculture and Forestry. Conserving the genetic diversity of forest trees is also an objective of statutes governing trade in forestation materials and of tree breeding schemes.

Ex situ methods are used in forestry when a tree species is rare and only occurs in small patches, or when the habitat is endangered. Ex situ conservation involves the use of genetic resource collections (especially valuable broadleaved trees), transplantations and seed bank.

International cooperation is organised within Europe through the EUFORGEN Programme, and in the Nordic Countries through the Nordic forest tree genetic resources network of the Nordic Council for Forest Reproductive Material (NSFP).

Fish genetic resources

Local fish stocks have been damaged by hydrological engineering, pollution, stocking with alien fish varieties, and fishing, with consequent losses in genetic diversity. Most stocks of sea trout in coastal rivers have disappeared, for example, although some genetic features of trout stocks may remain in the local trout stocks of watercourses further inland.

Challenges

Urgent measures and seed searches will be required to save stocks of landrace crop varieties, as such seeds are disappearing. Special subsidy agreements for the maintenance cultivation of indigenous plants based on the environmental subsidy system for agriculture have not adequately promoted in situ conservation on farms, as only ten farmers have made agreements to raise old landrace species. Conditions for subsidies for the cultivation of indigenous crop varieties are excessively complex, and do not effectively encourage farmers to grow them. Landrace varieties of garden plants should also be covered by their own agrienvironmental subsidies. At the moment they are not covered by any subsidies system. It has not yet been possible to define subsidy measures for them that the European Commission would be ready to approve.

Breeding agreements and conservation programmes for indigenous breeds concluded under agricultural subsidy programmes have had a positive impact on the conservation of indigenous breeds. This has enabled the decline in population of some breeds to be slowed or even prevented. Populations of the Finnish landrace hen, Åland and Kainuu grey sheep, eastern and northern Finnish cattle and the Finnish landrace goat have increased in recent years. The number of Finnish cold blood horses and western Finnish cattle has remained unchanged. The number of the Finnish landrace sheep has diminished. The main reasons for the decline in population sizes of indigenous breeds have been the superior productivity of commercially dominant breeds and changing practices in agriculture.

Finland's native tree species are growing at the northernmost limits of their ranges. Transplantation tests have shown that tree stocks and species brought to Finland from elsewhere generally do not thrive. As perennial plants, forest trees must withstand the large temperature variations of Finland's present climate, and predicted climate change would require them to show even greater adaptability.

The existence of local and neighbouring trout stocks conserved in inland watercourses and the prospects for their conservation and their use for fish farming and other purposes should be investigated. Attention should also be paid to opportunities to conserve marine grayling stocks through fish farming.

Genetic diversity will also decrease in the event of any substantial fall in the sizes of fish stocks to be maintained. The number of genetic forms to be maintained for the future may consequently decline. The Finnish Game and Fisheries Research Institute has a living gene bank (parent fisheries) containing 16 species or varieties of fish of 64 different stocks, and a milt bank containing male individuals of 12 species or varieties of fish of 42 different stocks. Most of the cultivated fish are threatened. The fisheries authorities' Saimaa salmon conservation strategy and the forthcoming Saimaa arctic charr conservation strategy will promote measures to conserve these species.

Objectives

Care should be taken to conserve the diversity of cultivated and garden plants (especially landrace species and transformed stocks of old commercial species). A national genetic resources register should be established to promote onfarm conservation. Conservation and the sustainable use of agricultural and garden plant genetic resources should be ensured in the long term. Ex situ gene banks should be improved and expanded, and onfarm conservation should be promoted.

Care should be taken to ensure that indigenous breeds of domesticated animals do not become extinct, and that their genetic diversity remains as broad as possible. Efforts should be made to ensure the continued operation of cattle gene banks. It is desirable to continue breeding subsidies for indigenous breeds. It is also worth striving to ensure that the amounts of subsidies payable for various breeds reflects the importance of the respective breeds for maintaining the genetic diversity of domesticated animal species. Breeding programmes should take into account the adaptation of indigenous breeds to Finnish conditions. Associated expertise in domesticated animal genetics, and in the breeding and conservation of domesticated animal genetic resources should also be maintained and reinforced. The conservation and sustainable use of forest tree genetic resources should be ensured in the long term. The genetic diversity of Finland's fish stocks should be maintained.

Measures

54) The Finnish National Programme for Plant Genetic Resources for Agriculture and Forestry will be implemented. • MAF, 2006-2016

55) The Finnish National Programme for Animal Genetic Resources 2004-2010 will be duly implemented. • MAF, 2006-2010

56) The diversity of forestation genotypes will be maintained. Finland will work within the EU and in international contexts to ensure that the conservation and sustainable use of forest tree genetic resources are included in international agreements, and Finland will actively implement such agreements. Care will be taken to ensure that longterm programmes for forest improvement and seed management and legislation governing the production of enhanced forestation materials also pay adequate attention to the objective of genetic diversity. An adequate number of timber gene reserve forests and conservation collections will be established and maintained. • MAF, 2006-2016

57) The conservation of the genotypes of the most important fish farming species (rainbow trout, whitefish) and other fish (including trout and arctic charr) will be initiated, with gene banks also built up. Fish farming will continue with a view to maintaining the broadest possible genetic diversity of parent fish shoals producing spawn for stocking. The operations of fish milt banks will be expanded in accordance with a revisable milt bank programme. The genetic diversity of economically important fish stocks will be maintained by such means as regulating fishing, rehabilitating watercourses and maintaining sufficiently large parent fisheries where necessary, and also by storing genetic resources in a gene bank. • MAF, 2006-2016

Access to genetic resources and benefit sharing

Background

The Bonn Guidelines seek to implement the third objective of the CBD: access to genetic resources and fair and equitable sharing of the benefits arising from their use. The Guidelines are also intended to promote conservation and sustainable use of biological diversity. They cover all types of genetic resources falling under the scope of the CBD, together with associated traditional knowledge, innovations and practices, and benefits arising from their use. The Guidelines have the character of recommendations facilitating the creation of legislative, administrative or policy measures pertaining to the access to genetic resources and the sharing of benefits.

While the Bonn Guidelines are not legally binding, the unanimous approval of 180 States is an indication of international interest in this subject. The Guidelines gained further importance when States were urged at the World Summit on Sustainable Development in 2002 to agree on an international regime under the CBD that would promote and ensure a fair and equitable distribution of the benefits arising from the use of genetic resources by complying with the Bonn Guidelines and promoting their use. The Bonn Guidelines form part of that broader system, and are an important instrument for implementing the CBD and safeguarding biological diversity. The Johannesburg Plan of Implementation also stresses the need to take practical steps to promote ac-

The CBD Bonn Guidelines and the development of an international genetic resources regime under the Convention

The Bonn Guidelines (Decision VI/24) concern Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization. Compliance with the Guidelines is voluntary, and their objective is to guide users and providers of genetic resources in situations in which such resources are exchanged within and between countries. The Guidelines explain the various stages in the process of accessing genetic resources and sharing the benefits arising from their use, and stress the duty of users to seek the prior informed consent (PIC) of the providing Party. The Guidelines also explain the basic principles for mutually agreed terms (MAT), and they define the responsibilities of users and providers. The Guidelines also deal with other factors such as incentives, issues of liability, means of verification and settlement of disputes, and they contain a proposal on the elements of a material transfer agreement (MTA).

The function of the Ad Hoc Openended Working Group on Access and Benefitsharing established under the UN Convention on Biological Diversity (ABS/OEWG) is to negotiate in accordance with a decision of the 2002 Johannesburg Summit on Sustainable Development for an international regime regulating access to genetic resources and benefit sharing. This regime will consist of existing and new statutes and guidelines at various levels.

cess to the results and benefits of biotechnology based on genetic resources.

Current situation

The Genetic Resources Committee set up a subcommittee in October 2004 to consider the objectives and national implementation of the Bonn Guidelines. In July 2006 this subcommittee completed its background report for the national implementation of the Bonn Guidelines on access to genetic resources and benefit sharing. The report is intended as a basis for the implementation of the Bonn Guidelines in Finland.

Challenges

At the first stage of implementing the Bonn Guidelines nationally a study must be made of what kind of system is desirable for Finland, and of whether new legislation on access to genetic resources and benefit sharing will be needed to implement this. The system to be created and the instruments to be employed for its implementation must be harmonised with other national and international legislation on genetic resources. The starting point for developing a system concerning access to genetic resources and benefit sharing will be the basic principle of the CBD according to which States have sovereign rights over their own natural resources. This means that States are free to decide on the kind of instruments that they will use to achieve the objectives of the CBD.

Objectives

The transfer of genetic resources should take place in accordance with the applicable provisions of the CBD or of the International Treaty on Plant Genetic Resources. The benefits arising from the commercial or other uses of genetic resources should be shared with the countries that provide them in compliance with mutually approved procedures.

Measures

58) On the basis of the background report prepared by the subcommittee of the Genetic Resources Committee, the next steps for implementing the Bonn Guidelines in Finland will be examined, including the need for action on essential legislative issues and the development of administrative practices in accordance with Article 15 of the CBD, having regard where necessary also to obligations arising from other international agreements.

The Genetic Resources Committee, which deals with issues related to genetic resources in agriculture under the supervision of the Ministry of Agriculture and Forestry, will examine Finland's national obligations related to the implementation of the International Treaty on Plant Genetic Resources for Food and Agriculture and the Bonn Guidelines with regard to agricultural genetic resources. • MEnv, MAF, 2006-2007



Cross-cutting measures

Policy instruments

Legislation

Background

Longterm measures are required to safeguard biodiversity. Legislative and administrative instruments conventionally play a key role in this context.

Current situation

Most legislative controls concerning biodiversity are based on the Nature Conservation Act (1096/1996). The Act on the Protection of Wilderness Reserves plays a key role in guiding land use in Finland's northernmost regions. The Act on the Protection of Rapids and certain individual statutes safeguard important sites along watercourses. The Land Extraction Act also protects biological val-

ues. The Forest Act, the Water Act and the Land Use and Building Act additionally include provisions that safeguard diversity. The provisions governing impact assessment for the EU's Natura 2000 network also guide national legislation and policymaking. The Nature Conservation Act took effect at the beginning of 1997. While some amendments have subsequently been made to the act, no overall assessment has yet been made of its effectiveness and impact.

Challenges

Implementation of nature conservation has largely depended on legislative and administrative instruments. Even though the current legislation is relatively new, it is time to begin reviewing its effectiveness and impact in order to respond to growing challenges in this field. When using natural resources and in land use it is important to adopt approaches focusing on information and economic

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instruments alongside conventional instruments, so as to give various stakeholders opportunities to voluntarily conserve biodiversity. The Nature Conservation Act should be revised so as to also stress the importance of genetic diversity in ensuring the conservation of taxa lower than species.

Objectives

Legislative and administrative instruments should be developed and the range of policy instruments should be expanded, increasing the role of voluntary actions by various stakeholders. The Environmental Protection Act must particularly be revised to ensure that the natural values of mires are duly considered when dealing with permit applications for peat extraction.

Measures

59) Preparations will begin in 2008 of an overall assessment of the effectiveness and impact of the Nature Conservation Act, which came into effect in 1997. This process will also include a review of points of contact with other legislation. The assessment will serve as a basis for proposals for improvements needed in legislation. • MEnv, 2008-2010

60) The conservation of biodiversity will be given due consideration when preparing new legislation guiding the use of natural resources and land use. • All ministries, 2006-2016

Financial incentives and other incentive measures

Background

Economic incentives, advice, guidance and the development and application of sustainable land use principles encouraging voluntary conservation measures are becoming increasingly important in various sectors, in addition to legislative controls. Economic instruments designed to promote biodiversity have already been applied in Finland, but their use has so far been on an ad-hoc basis and limited. There is a clear need for improved and expanded economic incentives, as has also been noticed internationally, for example, in the OECD work done on this topic.

The Ministry of the Environment has commissioned a basic study of biodiversity as an economic issue. This study will be based on decisions and recommendations of the OECD Working Group on Economic Aspects of Biodiversity and the CBD. It will include concrete options and recommendations (research, creation of markets, direct incentives, policy instruments, administration and infrastructure) for applying economic incentives and measures to promote the conservation and sustainable use of biodiversity in Finland.

Finland has a long history of private nature reserves established on the basis of applications made by landowners. The role of such reserves in implementing conservation programmes has been growing in recent years. Counselling has also played a central role in agriculture and forestry for many years. The METSO Programme has particularly helped to focus attention on various aspects

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of conserving biodiversity. The prominence of environmental issues in agriculture has likewise increased substantially.

Current situation

Environmental subsidies for agriculture and the Act on the Financing of Sustainable Forestry (1094/1996) have significantly expanded opportunities to secure financial subsidies for measures to maintain biodiversity. The procedure developed for paying compensation for damage caused to reindeer husbandry by golden eagles, whereby financial compensation is granted to a herdsman's committee based on the number of nests producing eagle fledglings, may also be regarded as an example of a functional system of economic guidance.

Challenges

Widespread practical application of voluntary conservation instruments and the development of forest conservation incentives to support environmental management and conservation are an essential condition for promoting nature conservation in future decades. Alongside communication, counselling and practical guidelines, it is also important to allocate new agricultural, rural development and agrienvironmental financing instruments in sites and purposes that are important from the point of view of biodiversity. There is also scope for improving the role of economic incentives in species conservation.

Consideration of economic incentives under the CBD

Several articles of the CBD deal with economic issues. For example, Article 11 says that "each Contracting Party shall, as far as possible and as appropriate, adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biodiversity". Under the recommendations issued to both the CBD Parties and the OECD member states, economic instruments should be increasingly and more consistently adopted as part of the implementation of national biodiversity policy. Attention has particularly been paid to incentives related to the conservation and sustainable use of biodiversity, to eliminating harmful incentives, and to finding new economic and employment opportunities to support the conservation and sustainable use of biodiversity.

Objectives

Appreciation of the economic aspects of biodiversity should be increased. Motivating and expedient economic instruments should be applied to promote the conservation and management of biodiversity.

Measures

61) Subsidy systems will be assessed and revised where necessary to prevent incentive effects that are harmful to biodiversity. The opportunities provided by new financing instruments for enhancing agricultural environments, rural nature management and conservation, and the ecological planning of landscapes will be exploited in various ways.

• MAF, MF, MEnv, 2007-2013

62) The results of the METSO Programme assessment, due to be completed during 2006, will be used in developing policy instruments for nature conservation. Particular attention will be paid to interaction between authorities and the public, to the extensive adoption of voluntary conservation instruments, and to the development of economic incentives for nature management and conservation.

• MEnv, MAF, 2007-2010

63) Economically motivating financing instruments will be investigated in order to prevent or compensate for losses, especially those caused by large predators and seals. • MAF, 2007-2010

Training and education

Background

General education can improve the public's understanding of biodiversity issues. The conservation of biodiversity is included in the values, subjects and pedagogical content of the new curriculum principles approved for general education in Finland. Promoting sustainable development and conserving biodiversity are also part of the national curriculum principles for vocational education. The aims of the sustainable use and conservation of forests and other natural resources were considered during the revision of training schemes in the natural resources sector and the vocational qualification in forestry.

Current situation

Responsibility for the environment, wellbeing and a sustainable future is a subject area in the principles of the general education curriculum. The general education system seeks to educate people to be environmentally aware and committed to sustainable lifestyles. The curriculum principles stress the development of favourable environmental attitudes in the early years of general education. Pupils should be able to describe features of various habitats and to recognise their most common plant and animal species. One important topic of biology studies in the 5th and 6th grades is biodiversity and an appreciation of its importance. The aim of teaching will be to investigate local creatures and habitats such as forests and mires, and to identify their principal species. This will be supported by guided plant collection. Biology teaching at

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grades 7-9 will strengthen learners' understanding of biodiversity and the importance of its conservation. Identification of the principal local species of plants, animals and fungi will also be expanded in grades 7-9 through guided plant collection. School students will be able to compile either a conventional or digital guide to flora.

Respect for living things will also be one of the basic values of senior high school education. Sustainable development will be a subject area at senior high school. Students will have to learn the ecological basis of sustainable development and be able to measure, assess and analyse changes in the natural environment. Sustainable development will be reinforced in senior high school biology, particularly from the point of view of biodiversity and ecological problems in the environment. The aim is for students to appreciate biodiversity as a natural resource, to become aware of the threat to species and habitats, and to understand the significance of the decline in diversity. In addition to biodiversity and ecological problems in the environment, more advanced environmental ecology courses in senior high school biology will study the vulnerability of the Finnish environment and indicators of environmental quality. Students will design and carry out an ecological research project of their own. Senior high school geography instruction will also consider biodiversity issues on a compulsory physical geography course for all students, on an advanced regional research course, and on a geography course on environmental hazards.

Ensuring sustainable development and safeguarding biodiversity are common objectives of the national curriculum principles for vocational education in all subjects. Training and education on the conservation, management

The CBD programme of work on communication, education and public awareness

Communication, education and public awareness (CEPA) are important crosscutting themes in implementing the 2010 objective. The CEPA programme of work (Decision VI/19) has been prepared to implement these themes. Shortterm priority activities for the CEPA programme of work and a longterm implementation plan were approved (Decision VIII/6) in support of the work programme at the 8th Conference of the Parties to the CBD (Curitiba, 2006). These decisions include duties for both the CBD Secretariat and the Parties to the CBD. These duties concern such matters as establishing administrative mechanisms and collaboration networks to promote implementation of the CEPA work programme, and the practical operation of these mechanisms and networks, including assessments of national baselines. Efforts are being made in EU Member States to integrate CEPA measures at least into National Biodiversity Strategies and Action Plans, or to prepare national CEPA strategies and action plans coordinated between the various relevant actors.

The national CBD clearinghouse mechanism (CBD CHM, known as LUMON-ET in Finland) is an important instrument for improving communication, education and public awareness. The 8th Conference of the Parties to the CBD approved an updated CHM strategic plan for 2005-2010 and a programme of work extending until 2010 (Decision VIII/11).

This decision includes duties for both the CBD Secretariat and national CHM systems. The programme of work also includes the reinforcement of collaboration between national CHM and GBIF systems.

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and sustainable use of biodiversity has been increased and improved in various fields of professional training, including forestry.

In accordance with the policies of the National Forest Programme (KMO), the National Board of Education is involved in research initiatives and projects on sustainable forestry, with related communication measures directed at young adults. The “Learning Path for Forests” and “Opportunities Lie in Forests” projects conducted with the Finnish Forest Association and the Finnish 4H Federation have achieved good results in improving the forest awareness of young adults in various parts of Finland. Also under way are the Nordic Forest Ecosystems and Education project, the GLOBE programme, and the Environment and School Initiatives (ENSI) project, which seeks to enhance sustainable development education using new information technology. The environmental certification of schools and educational institutes began in March 2004.

Challenges

The education sector follows information on biodiversity and the factors affecting it through research findings, so collaboration between environmental researchers, the environmental administration and educational planners is important. The choice of pedagogical approach to biodiversity and factors affecting it and the methods adopted for developing student thinking to encourage sustainable lifestyles are essential matters for teaching work. An adequate knowledge of different species underpins learners' ability to perceive the natural world and the structures

and functions of ecosystems. Without this knowledge, students' environmental attitudes can remain superficial, with no desire to conserve the natural environment and its diversity. Additional emphasis has been placed in the general education curriculum on recognising plant species, in response to a perceived lack of species knowledge among students and teacher trainees in Finland. Efforts are also being made to harness new information technology in support of botanical teaching and studies of plant species.

Ready access to materials is important for improving standards in teaching and educational institutions. Schools have a growing need for information on the state of the local environment. Students' and teachers' access to monitoring results, in both conventional and digital form, for species and biotopes that are threatened or otherwise protected, is a precondition for the reintroduction of plant collections to schools. Geographical information system (GIS) software specially developed for teaching in schools will enable students to conduct investigations using the opportunities provided by new information technology. Geographical information on the state of the environment, such as data on the diversity of habitats and species, should be readily available to schools without charge.

Regional environment centres and forestry centres could also disseminate geographical information on biodiversity and other aspects of the environment to schools. The national organisations that monitor biodiversity will also be important partners for schools. In addition to being important users of biodiversity data, schools could also become important producers of such information.

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The problem of using monitoring data in schools lies in their decentralised character, and low level of “value added” for teaching purposes. It would be important to establish a uniform, simple and open public biodiversity data management system. Regionally processed environmental information, databanks and biodiversity indicators are important teaching materials for schools. It is also important to improve collaboration between the educational administration and public authorities, organisations and research institutes engaged in monitoring, as new environmental enthusiasts must be inspired to get involved in biodiversity monitoring. Students must gain a more profound understanding of how human activities affect biodiversity. This will also be accompanied by greater awareness of how human beings should modify their behaviour in order to conserve biodiversity. Vocational education requires national information on biodiversity, details of threatened species and habitats, and an awareness of the commercial and vocational practices that jeopardise biodiversity, and those that promote conservation.

Under the Government plan for developing the educational sector (2003-2008) and the National Forest Programme of the present administration, ensuring Finland’s social wellbeing and economic competitiveness remains a prime concern of the education and research system for each vocational sector. As Finland has entered into an international commitment to respect the principles of sustainable ecological, social and economic development, the foregoing development plan places additional emphasis on this perspective in coming years, for example in enhancing forestry training.

Objectives

Environmental education on biodiversity should be promoted at every level from nursery and preschool to higher education, with biodiversity monitoring data made easily available free of charge for education. New forms of co-operation should be developed between educators and organisations responsible for monitoring biodiversity. More supplementary teacher training should be provided, focusing on awareness of species and pedagogical skills related to biodiversity, with supporting high standard online educational materials provided to improve knowledge of species and new information technology used to enhance education for sustainable development.

Visitor centres run in connection with national parks by Metsähallitus represent significant investments by the environmental administration that aim to increase the public awareness of nature and provide facilities for educational studies. Schools and other educational institutes benefit greatly from the services provided by visitor centres. Their facilities and wide audience should be more effectively exploited, and their activities should be expanded from the perspective of the whole environmental administration in collaboration with the educational administration.

Measures

64) Supplementary teacher training will be developed to improve awareness of species and pedagogical skills related to biodiversity. New information technology will be harnessed to boost levels of knowledge about species and sustainable development education.

• MEd, 2007-2010

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65) Students' awareness of human impacts on biodiversity will be improved through improvements to general education, support for schools' nature clubs, and enhanced consumer education.

• MEd, 2006-2016

66) A study will be conducted in vocational education into how students in each sector should be trained to purposefully work in their future occupations to help maintain, conserve or enhance biodiversity, with changes made to syllabuses as necessary. • MEd, 2007-2010

67) Co-operation will be enhanced between environmental research, providers of environmental information, the environmental administration and the educational administration. Cooperation between regional environment centres, Metsähallitus visitor centres and educational institutions will be improved. • MEd, MEnv, MAF, 2007-2010

Communication and improving public awareness

Background

Surveys and other studies indicate that the need to conserve biodiversity is understood quite well at a general level. The level of public awareness of nature conservation in Finland may be considered high by international standards. Nature conservation is in practice subject to various prejudices and misconceptions, however. One important underlying contributory factor to such problems is the experiences of many landowners with controversial nature conservation initiatives.

Current situation

In spite of developments in administrative procedures, landowners do not yet seem to fully trust environmental officials. Attitudes have nevertheless become more collaborative on both sides, with experiences obtained through the METSO Programme particularly showing that voluntary measures can achieve favourable results.

Challenges

From the point of view of the environmental authorities, the findings of the METSO Programme still give cause for further substantial changes in operating methods. It is necessary to maintain public interest through information, counselling and guidance, and by encouraging amateur nature studies. The rapid evolution of internet communications is creating many opportunities for public partici-

pation, for example in creating and receiving data on the natural environment.

Objectives

Public awareness of the ecological basis of biodiversity and of the benefits of conservation for the national economy, business and individuals should be increased. Information should be compiled on good practices and methods. Information should be disseminated even on difficult themes and aspects of biodiversity in an intelligible and motivating way, stressing the responsibility of people in Finland for national species and biotopes. Information should also be compiled on species and biotopes to form motivating and inspiring publicity materials.

Measures

68) Ministries and other interest groups will work together to prepare and initiate a communications programme to improve the public awareness and social acceptability of the conservation of biodiversity and the sustainable use of natural resources. • MEnv, MFA, MAF, 2007-2010

69) Information materials and guidebooks will be prepared and published specifically for various user groups on the conservation, management and sustainable use of biodiversity. Opportunities will be investigated for increasing the production of high standard Finnish nature documentary films and videos. • MEnv, MEd, MAF, MTC, 2007-2010

Biodiversity in land use planning

Background

Increasingly intensified construction, road networks and other land use practices have been reducing the numbers of areas of natural habitat and causing the fragmentation of remaining areas. Integrated habitat patches have shrunk in size, with the remaining patches increasingly isolated from other patches. The proportion of edge areas unfavourable to many species has increased. Fragmentation further exacerbates the negative impacts of declining total areas of habitat.

The CBD (Article 14) requires assessment of the environmental impacts of any projects that are likely to have significant adverse effects on biodiversity. The aim is to avoid or minimise such impacts. Decisions and guidelines concerning the “ecosystem approach” (Decision V/6) have also been formulated under the CBD. The Finnish Ministry of the Environment has prepared a provisional review of the ecosystem approach and its application in Finland.

Current situation

Impacts on biodiversity are assessed as part of land-use planning, the environmental impact assessment (EIA) of plans, programmes and individual projects, and Natura assessments under Section 65 of the Nature Conservation Act. The main principles guiding the consideration of impacts on nature in EIAs are the avoidance of biodiver-

The ecosystem approach within the CBD

The ecosystem approach (Decision V/6) format comprises twelve general principles and five points of operational guidance seeking to secure a comprehensive vision of the conservation, management and sustainable use of natural habitats and natural resources (Description, Principles, and Operational Guidelines for the Ecosystem Approach). The format stresses conservation of the natural structures and functions of ecosystems to secure ecosystem services, i.e. environmental values and processes that produce benefits in various ways. The approach begins by defining the boundaries of each ecosystem concerned, and identifying the interest groups associated with the use of such areas. After the structure, functions and state of the ecosystem have been assessed and measures for conservation, management and sustainable use have been identified, then guidance instruments and economic incentives are reviewed, and flexible and adaptable management of the said ecosystem is implemented, with regard to the impacts of activities on surrounding ecosystems. The concept of the ecosystem approach has, however, been difficult for people in Finland to grasp fully. It has been suggested that the term sustainable use should instead be used more widely with its related concepts.

sity loss and the precautionary principle. Public participation and interaction are also important in matters related to biodiversity.

The concentration of settlement, other construction and busy highways in southern Finland has already created a situation in places where the ability of animals to live and move around naturally is limited. In 2003 the Finnish Road Administration published a manual on how to facilitate the movements of wild animals through road planning. Although the various solutions offered in the manual were designed for highways, they are also suitable for implementation in the road networks within settlements and urban areas. Consideration has also been given to ecological corridors in landuse planning to some extent. Principles of sustainable use that consider natural ecosystems have been applied in several projects in Finland, thanks to such factors as established planning practices, comprehensive legislation, a working group culture that incorporates interest groups, and participatory planning. The bestknown example of this approach is probably the natural resource plans drawn up for state-owned commercially managed forests. Sustainable use principles are also applied in the multiobjective forest planning for privately owned forest, and in local agricultural development projects seeking to increase organic production or maintain heritage landscapes. Implementation of the EU Water Framework Directive is currently being organised in Finland building on the concepts of river basin districts and river basins as coherent entities as intended in the ecosystem approach.

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Challenges

It is currently difficult to make allowances for various aspects of biodiversity as widely as would be desirable. Procedures for considering indirect and cumulative impacts on nature remain undeveloped, and are often ignored because each project is unique, with no way of comprehending the broader evolution of the same natural area at landscape level. It is particularly difficult to develop land use planning methods from the current practice of implementing marginal terms towards a more extensive and flexible appreciation of trends in biodiversity. Harmonising sustainable use and conservation in planning is a correspondingly difficult challenge.

Environmental impact assessment often focuses solely on the occurrence of certain species and habitats within the planning zone. There has been a substantial inability to perceive structural features of the environment and their natural evolution, or the significance of observations at habitat level, species level and genetic level.

Biodiversity is highly appreciated by the public. Active public participation in environmental impact assessment procedures is vital to ensure that public impressions are included in environmental assessments, as well as the views of specialists.

Objectives

Principles of sustainable use that account for natural systems should be applied in environmental impact assessments, especially at the planning and programming level where real alternatives and more extensive areas can be naturally reviewed.

The perspective of the sustainable use of nature should be given prominence in planning. Impact assessments should pay greater attention to the practical benefits that can be obtained from biodiversity, and to how a project will affect various groups' access to these benefits.

Natural systems should be duly considered in land use planning and road planning. Planning should be based on sufficiently thorough studies of the natural environment that also allow for ecosystems and their functioning outside of the planning zone. Damage to biodiversity arising from fragmentation of continuous natural areas should be prevented or reduced.

Measures

70) Opportunities will be developed to promote the application of the concept of sustainable use accounting for natural systems in natural resource and land use planning and in environmental impact assessments. In areas designated for conservation by the State that have not yet been included in approved local master plans, regional land use plans or the Natura 2000 network, conservation needs and priorities will be defined, as well as the need for management planning, with conservation measures subsequently implemented. Steps will be taken to ensure that information about the biodiversity impacts of evaluated projected developments is promptly available to decisionmakers.

- MEnv, MAF, MTC, MTI, 2008-2016

Biodiversity as an economic issue

Background

Finding economic and employment opportunities related to biodiversity is important for the social acceptability of conserving and managing biodiversity. Considerable international attention has been paid recently, for example, to the costfree ecosystem services provided by the environment, and to investigating and promoting related financial and market mechanisms.

Current situation

Although research into the economic values and opportunities associated with biodiversity has expanded recently, the practical application of research findings for nature conservation and management remains haphazard and experimental.

The tourism business is probably most active in exploiting nonmaterial environmental values and the related images in promoting its operations. Nature tourism is currently the most rapidly growing tourism sector. Favourable environmental impacts form part of the public image of entrepreneurs and businesses, and are reflected in terms of success on the market. The opinions of customers can be affected even at some considerable distance from actual operations, which imposes special demands on businesses.

Finland has a great deal of expertise in biodiversity, and there is a demand for this on the labour market and in various international projects. The ability of specialists

trained for the sector to serve in various administrative, planning and international projects should be enhanced from the earliest stages of studying, by providing opportunities for gaining work and practical training experience, for instance.

Challenges

Finland still needs to do a great deal of development work in the field of exploiting the economic opportunities provided by biodiversity. If nature conservation and the ecologically sustainable use of natural resources are viewed merely as additional expenses, then there will be insufficient approval for the measures needed to halt the decline in biodiversity.

Research and development work on the use of natural resources must naturally also study the costs and possible financial constraints of conserving biodiversity from the point of view of both the national economy and individual and corporate finances. It will be expedient to minimise and avoid such costs and negative impacts.

The EU Environmental Liability Directive must be transposed into Finnish legislation during 2006. This Directive also includes liability for damage caused to biodiversity. Risk assessment and investigation of the costs of rehabilitation will serve the general needs of economic policymaking in respect of risk prevention and remediation of damage, and will be of practical help in preparing the State authorities, insurance companies and enterprises to deal with the related work.

Objectives

Appreciation of the economic linkages of biodiversity should be increased with a view to the development of innovations and new forms of livelihood.

Measures

71) A project will be launched to help to identify the economic opportunities provided by biodiversity and to promote sustainable use. Studies will be conducted into new opportunities provided by biodiversity in Finland in the fields of biotechnology, food production and organic products. • MEnv, MF, MEd, MAF, MTI, MOL, 2008-2016

72) Methods will be developed for assessing the economic impacts of risks to biodiversity. Special attention will be paid to the longterm economic risks caused by the negative impacts of climate change on biodiversity, and to economic risks arising from oil spills and chemical accidents or other such sudden incidents.

• MEnv, MAF, MTC, MTI, 2007-2016

Preparing to cope with major anthropogenic environmental changes

Climate change

Background

The current decline in biodiversity is due to land use changes, pollution, the excessive use of animal and plant species for human needs, and other direct consequences of human activities. Climate change will also have a substantial impact on biodiversity. Extensive international research has indicated that recent regional changes in temperatures have had detectable effects on many of the planet's physical and biological phenomena. There is evidence of glacier withdrawal, melting of permafrost, shortened seasons of ice coverage on rivers and lakes, and extending growing seasons. Winter precipitation and extreme weather events are also forecast to increase, especially in northern regions. Changes in precipitation will also affect the exchange of water between the Baltic Sea and the open seas, and thus its salinity, which could have considerable effects on species throughout food webs in marine ecosystems. Reductions in winter ice coverage will lead to the partial loss of icy winter habitats, which would particularly affect the breeding conditions for seals. Changes in temperature and salinity could favour the spread of marine invasive alien species through the Baltic. Climate change imposes substantial further pressure on the natural environment in addition to other human impacts.

Northern ecosystems are inherently sensitive to irreg-

The CBD and climate change

The CBD regards climate change as a major threat to biodiversity. Climate change affects ecosystems (especially coral reefs, wetlands, forests, alpine and Arctic regions), the sustainable use of biodiversity, and the livelihoods that this supports. The Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) established under the CBD has been asked to assess how the effects of climate change could be controlled, and how adaptation of the natural environment to its negative impacts could be promoted. To support this work the Intergovernmental Panel on Climate Change (IPCC) prepared a review of the relationship between climate change and biodiversity for use under the CBD. The SBSTTA then appointed two adhoc technical expert groups, one to report on the effects of climate change and mitigation instruments, and the other to consider promoting adaptation to climate change from the point of view of biodiversity (CBD Technical Series No. 10 and No. 25). Finland has actively supported these teams of experts financially and otherwise.

The 8th Conference of Parties to the CBD (Curitiba, 2006) stressed the importance of research and consideration for biodiversity in various action plans and individual measures taken for the purpose of adapting to climate change (Decision VIII/30).

Greater consideration should be given to preparing for climate change and conserving biodiversity in a changing climate when revising programmes of work under the CBD. Creation of rapidly serviceable assessment methods was urged for planning and implementation of adaptation measures. The Parties were also invited to promote research in the sector based on the research needs proposed by the adhoc technical expert groups. The Parties should pay attention to the most sensitive areas and ecosystems and to their local communities. The Decision also stresses collaboration with the Climate Change Convention (UNFCCC), the Desertification Convention (UNCCD) and the Ramsar Convention on Wetlands. The aim is to find actions that could promote the objectives of all of the Conventions simultaneously, and especially at national level.

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ularities in natural phenomena and changes in the species composition. Many ecosystems are directly in danger of disappearing completely, as they have no real prospects of adapting to changing climatic conditions. Air and soil pollution also impairs the recovery and resistance capacity of arctic and northern environments. Climate change forecasts indicate that rises in temperature will be steepest in northern regions. On the other hand, the production capacity of northern ecosystems may also theoretically increase as the climate grows warmer. This may have both favourable and harmful impacts on biodiversity.

Current situation

Numerous studies have observed that several hundred species on Earth will undergo statistically significant changes in relation to anticipated rises in temperature and the biological characteristics of these species. Climate change and especially increased regional temperatures have already affected the breeding seasons of animals and plants, the length of the growing season and/or animal migrations and movements, the ranges and population sizes of species, and the occurrence of pests and diseases. There is a danger that climate change will reduce the ecological, economic and social benefits that biodiversity provides for human beings.

Challenges

Provisional assessments have been made of the impacts of climate change on biodiversity. On the basis of these assessments, it has been suggested that the best way to

support the adaptation of biodiversity would be to establish sufficient ecologically functional networks of protected areas. In changing conditions the ecological connections between protected areas – the connectivity of the network – is considered especially important. The impacts of networks of marine protected areas seem uncertain, however, since such areas will inevitably undergo the same changes as unprotected marine ecosystems.

The relationship between biodiversity and climate change imposes new challenges on the conservation and sustainable use of biodiversity, for example concerning information gathering. New research data will be needed on the impacts of ongoing climate change from the point of view of the effectiveness of protected area networks, especially in respect of watercourses, mires and wetlands, and the species of cold and northern habitats such as arctic fells. Information will particularly be required on the impacts of ongoing climate change on the ecology of protected areas, on the processes that sustain biodiversity, on relationships between species and on the functioning of food chains. Preparations for change may already begin now, such as analyses of the sensitivity of species and ecosystems to climate change.

Objectives

The effects of climate change on biodiversity should be investigated, so as to enable the prediction at the earliest possible stage of the actions that will be necessary to reduce harmful impacts, or to adapt to them.

Measures

73) Finland's National Strategy for Adaptation to Climate Change (2005) and the climate change recommendations of the CBD and UNFCCC will be implemented.

• MEnv, MAF, MTC, MTI, MFA, MSAH, 2006-2016

74) A research programme on adapting to climate change, with ancillary activities such as gathering basic information of importance for monitoring and policymaking with respect to protected areas, will be implemented by the year 2010. • MEnv, MEd, MAF, MTC, 2007-2010

75) Methods will be developed for preparing climate change sensitivity analyses, for example with respect to the effectiveness of protected areas and the integration and connectivity of the protected area network. "Adaptive planning methods" that allow for preparation for and adaptation to climate change will be developed for assessing and managing land use risks. • MEnv, 2008-2012

76) Preparations will be made for ex situ conservation of the species most severely threatened by climate change. • MEnv, MAF, 2010-2016

77) Active international research and specialist collaboration will continue in the northern coniferous forest zone and the Baltic Sea to enable the preparation of possible regional adaptation strategies.

• MEnv, MAF, MEd, MFA, 2006-2016

Genetically modified organisms

Background

Genetic engineering techniques can be used to analyse and modify the genomes of organisms. In agriculture, forestry, game and fisheries genetic engineering seeks to increase the productivity of animals and plants, to improve their resistance to various diseases and environmental pressures, and to provide opportunities to enhance their characteristics in various ways.

The spread of genetically modified organisms (GMOs) imposes new kinds of challenges on the conservation and sustainable use of biodiversity. Certain bred properties may bring a selective advantage, and be able to become established in natural occurrences of related plants and in some cases possibly harm biodiversity. On the other hand, genetic engineering techniques may also be used for investigating and conserving biodiversity. Genetic engineering may be used to develop species and cultivation methods that reduce the burden on the environment, and species that are resistant to disease. Improved confidence in crop yields, lower pesticide use and farming methods that reduce soil erosion will all help to conserve biodiversity.

Current situation

The use of genetic modification in research, laboratories, industrial facilities, farming and various market products is governed by several European Community regulations. So far 18 genetically modified organisms have been approved within the EU for various uses, including farming

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and animal fodder. Some products manufactured using genetically modified organisms, such as starch products, plant oils and riboflavin (vitamin B2) may be used in Finland. The food, animal feed, and pulp and paper industries are very cautious about using genetically modified raw materials in their production processes. There is also national legislation governing the approval and use of GMOs. The strategy for biotechnology and genetic engineering in agriculture was completed in 2000; the genetic engineering strategy and action programme of the Ministry of Agriculture and Forestry for the period 2003-2007 was completed in 2003; and a set of proposed actions prepared by the working group investigating the prospects for coexistence of genetically modified crops with traditional and natural agricultural production in Finland was completed in 2005.

Genetically modified crop species are currently cultivated in Finland only for research purposes. There is no commercial farming of genetically modified plants in Finland.

Challenges

Harmful changes due to the spread of GMOs may occur through interaction mechanisms that are either natural or have arisen due to human activity. The greatest environmental risks among animal groups concern transgenic insects and fish. The probable immediate environmental risk from domesticated transgenic mammals is minor, and it appears that transgenic domesticated animals may be introduced into agricultural production at least to some extent in the near future.

Guidelines on invasive alien species under the CBD

Invasive alien species are considered as a crosscutting issue under the CBD and as part of several thematic work programmes under the Convention.

The 6th Conference of Parties to the CBD (The Hague, 2002) discussed the eradication and control of invasive alien species, the mitigation of their effects, and associated legal issues and guidelines. The Conference adopted 15 guiding principles for combating invasive alien species, preventing their access to the environment, and mitigating their impacts (Decision VI/23).

An ad-hoc technical expert group established under the CBD has reviewed deficiencies in the international system for regulating invasive alien species. Recommendations on this matter were adopted at the 8th Conference of Parties to the CBD (Curitiba, 2006). This conference paid particular attention to locating and closing the pathways of invasive alien species at national level, and to disseminating associated experience to other Parties, for example through the Clearing House Mechanism (CHM) established under the CBD. Aquaculture and marine aquaculture, ships' ballast water and civil aviation were particularly addressed (Decision VIII/27).

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It is important to prepare for the eventuality that GM crops may be farmed in Finland during the period of this Action Plan. In such cases, characteristics of GM crops such as herbicide resistance (including resistance to total herbicides such as glyphosphates), which is the most widespread GMO application worldwide, could lead to a further decline in the biodiversity of farmland. Total herbicides are capable of wiping out almost all natural plants in fields, together with their associated animals and the ecosystem services they provide such as pollination and biological insect pest control.

The use of aquaculture for food production will increase in future. Use of genetically modified fish will also increase on account of their ability to use feed more effectively and improve the ecological efficiency of fish farming. These features may increase the competitiveness of genetically modified fish in natural waters.

One reason for public concern about the use of genetically modified organisms is that this is a new technology that is relatively difficult to comprehend.

Objectives

The scientific assessment and monitoring of the environmental safety aspects of the use of GMOs in Finland should be reliable and of a high standard. The development of genetic applications that enhance the state of the environment should be promoted. Possible negative environmental impacts related to GMOs should be prevented.

Measures

78) The national strategy and action programme for genetic engineering will be implemented. • MAF, 2006–2016

79) Potential negative environmental impacts of GMOs will be prevented through a licensing procedure. Licensing will ensure that the study and use of GMOs incorporates scientific risk assessment and risk management. • MAF and MEnv, 2006–2016

80) Multidisciplinary research will be developed to review the environmental, health and socioeconomic impacts of genetically modified organisms, and support will particularly be given to necessary research into assessing and managing the risks of genetically modified applications developed in Finland, in respect of the ecological impacts involved in transferred features. • MAF, MSAH, MEnv, 2006–2016

81) Scientific and administrative assessment and policymaking procedures will be created for GMOs to cover a broad range of impacts on biodiversity. Public information and consultation will be reinforced. • MAF and MEnv, 2006–2016

82) The indicators included in existing monitoring systems will be analysed, and suitable new indicators will be developed to enhance monitoring of the functioning and impacts of GMOs. • MAF and MSAH, MEnv, 2006–2016

Invasive alien species

Background

New alien species are regularly found in Finland. These species are continuing to spread through both terrestrial and aquatic habitats. Changes in the ranges of species are a natural phenomenon. Several changes have occurred in Finland's flora and fauna in recent decades that may be viewed as natural processes, and therefore cannot and should not be combated.

In addition to natural propagation, the transfer of species to new habitats due to human action is a long recognised phenomenon. For example, species imported either deliberately or accidentally by European emigrants have caused extensive and irrevocable changes in the ecosystems of North America and Australia. Rapidly spreading invasive alien species, which can replace native species in ecosystems and radically change native biotopes, are considered to be the greatest threat to biodiversity after habitat loss and change. The spread of such species can also have considerable socioeconomic impacts.

The increasing volume, speed and capacity of transport both on land and sea are the main reasons for the spread of harmful invasive alien species in recent years. Other environmental changes caused by human beings, such as climate change, may exacerbate such problems by making conditions more favourable for alien species. Alien marine species can easily be transported from one marine area to another either in the ballast water of ships, or attached to the outer hulls of vessels. Examples of alien species that have become established in the Baltic Sea include the bay barnacle (*Balanus improvisus*), *Marenzelleria*

viridis and *Dreissena polymorpha*. Besides the Baltic Sea, the greatest threat is to various shoreline ecosystems. The most harmful of these invaders in terms of livelihoods have been species that cling to surfaces, such as *Balanus improvisus*, the Caspian polyp (*Cordylophora caspia*), and the fishhook water flea (*Cercopagis pengoi*), which clogs up fishing nets.

Current situation

Statutes governing alien species in Finland include the Nature Conservation Act (1096/1996), the Hunting Act (615/1993, amended 1268/1993), the Fishing Act (286/1982, amended 252/1998), the Animal Diseases Act (55/1980), the Act on Protection of Plant Health (702/2003), the Seedlings Act (1205/1994), the Seed Trading Act (728/2000) and the Act on Combating Insect and Fungus Destruction in Forests (263/1991). Efforts have been made to respond to the threat posed by alien species to the marine environment through the work of the International Maritime Organisation (IMO). The International Convention for the Control and Management of Ships' Ballast Water and Sediments was adopted in 2004. Finland has signed this Convention and is preparing its ratification.

Finland participated in the preparation of the "Introduced Species in the Nordic Countries" report published by the Nordic Council of Ministers in 2000. The Ministry of the Environment published a national Alien Species in Finland report in 2001. Finland is currently participating in the Nordic Baltic Network on Invasive Species (NOBANIS) project, which involves reviewing the current

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situation for alien species in various countries, and producing related materials for the Internet. Finland is also involved in international work on this subject through the International Plant Protection Convention (IPPC). Measures to eradicate small mammal predators (i.e. mink and raccoon dog) that have settled as alien species in Finland have been implemented in bird wetlands and the archipelago. Efforts have been made to improve public awareness of the problem of alien species through press releases and Internet materials. The situation in the Baltic Sea is regularly monitored, with the resultant data compiled in the Baltic Sea Alien Species database.

Challenges

One major challenge is to identify potential alien species and their pathways, and to detect invasion attempts at the earliest possible stage. Functioning systems are needed for the related monitoring, information exchange and risk assessment. It is also necessary to improve co-operation between public authorities in order to benefit comprehensively from the expertise within each sector in relation to the management of alien species.

Objectives

The aim is to control alien species in Finland through co-operation between officials both nationally and internationally.

Measures

83) Finland will participate actively in international co-operation to combat the spread of alien species through international trade.

- MAF, MTI, MEnv, 2006-2016

84) The national strategy and action plan for alien species required under the CBD will be prepared.

- MAF, MEnv, MTC, 2007-2010

85) Studies and monitoring of alien species will be continued in order to facilitate the recognition of their significance and the planning of the necessary countermeasures.

- MAF, MEnv, MTC, 2006-2016

86) Publicity materials will be published, for example on wellknown alien species known to be harmful, and means to combat their spread.

- MAF, MEnv, 2006-2016

87) Research and development work on methods of combating alien species that spread via the ballast water of ships will continue, with regard to the IMO International Convention for the Control and Management of Ships' Ballast Water and Sediments. Finland will also ratify this Convention.

- MTC, MAF, MEnv, 2006-2010

The sustainable use of biodiversity in tourism and recreation

Background

Tourism is the world's fastestgrowing business. It has also grown rapidly in Finland. Nature tourism is the fastestgrowing branch of the tourism sector, both in Finland and elsewhere. The appeal of the Finnish countryside, safety, good transport connections and a high standard of services all combine to provide a sound platform for further development of this industry in Finland. The tourism business is the most important resource for regionally balanced development, as nature tourism in particular provides employment and creates conditions for enterprise in remote rural areas of Finland where traditional livelihoods are in decline. Outdoor activities can favourably shape people's relationship with the natural environment. A personal affinity for nature is often a key factor behind support for the conservation of biodiversity.

Current situation

The impacts of nature tourism on the Finnish environment are generally not a problem, owing to the large surface area of the country, and the relatively small scale of its tourism sector. Domestic tourism focuses on towns and cities, other settlements, tourism routes and concentrations of tourist services. Extensive rights of public access enable people to move freely on privately owned land and waters. Most visitors are channeled along marked paths and hiking routes, and into recreational areas. Recrea-

Programme of Work for Article 8(j) of the CBD and related provisions

The Programme of Work on Article 8(j) and related provisions of the CBD on traditional knowledge (Decision V/16):

- ensures the full and effective participation of indigenous and local communities in decision making and policy planning under the Convention,
- undertakes to respect, protect and maintain traditional knowledge that is important for the conservation and sustainable use of biodiversity,
- promotes the broader use of traditional knowledge with the consent and participation of the indigenous and local communities concerned, and
- encourages the equitable sharing of the benefits of using traditional knowledge.

The Parties to the CBD have established an openended working group to formulate concrete proposals for implementing the foregoing commitments. The principal function of the working group is to prepare guidelines that will:

- stress that private and public institutions seeking to benefit from traditional knowledge must secure the prior informed consent (PIC) of indigenous peoples and local communities in accordance with the Convention,
- advise on how to assess environmental impacts when plans concern sacred sites or lands or waters that are occupied or used by indigenous and local communities, and
- assist parties in developing legislation and other mechanisms ensuring that traditional knowledge is respected, protected and maintained.

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tional areas cover about 1% of the country. Nature tourism accounts for some 25% of the Finnish tourism sector, providing 32,000 person years of employment annually. Increasing nature tourism and the consequent benefits for regional economies have made local attitudes to natural parks much more favourable.

Challenges

Under a decision-in-principle of the Finnish Government on the recreational use of the environment and nature tourism, an annual rate of growth of 8% will be sought in nature tourism with a view to doubling the employment impact of this industry by the year 2010. This will be done in an environmentally responsible manner by improving the value of the environment for recreational use. This objective will require the improvement of hiking routes and recreational areas in tourism centres. Improvements in the natural management of commercially managed forests will promote recreational opportunities through 'Everyman's right' of access to private lands and waters. Motorised land and water transport must be carefully directed. Facilities for the recreational use of protected areas should be improved where demand exists, with due regard to the need for sustainability.

Objectives

Employment, sustainable nature tourism and the recreational use of the countryside should be promoted in accordance with the decision-in-principle of the Finnish Government on the recreational use of the environment

and nature tourism, and the VILMAT programme for developing nature tourism and the recreational use of the natural environment.

Measures

See also measure 44)

88) Forest planning will be improved to support the multiple use of forests, and the use of recreational areas will be enhanced.

- MAF, MEnv, 2007-2010

Biodiversity and the indigenous Sámi people

Background

The Parties to the CBD recognise the close and traditional dependency on biological natural resources of many indigenous and local communities with traditional lifestyles, and the desirability of equitably sharing the benefits derived from traditional knowledge, innovations and practise concerning the conservation of biodiversity and the sustainable use of its elements.

Current situation

The Finnish Constitution guarantees the rights of the Sámi as an indigenous people to their own language and culture, and to autonomy in this respect in the Sámi homelands. The Treaty of Accession of Finland to the European Union incorporates special provisions on the status and rights of the Sámi as an indigenous people. The social status of the Sámi is also governed by such instruments as the Act on the Sámi Parliament (974/1995). Language legislation guarantees the right of the Sámi to use their native language in administrative matters. Legislation also guarantees citizens opportunities to receive basic education in their native language.

Finland has not ratified ILO Convention no. 169 concerning Indigenous and Tribal Peoples in Independent Countries. Under Article 14 of this Convention, the right of indigenous peoples to own and possess the lands that they have traditionally occupied must be recognised.

While Sámi land rights have long been studied in several contexts, no settlement satisfactory to the various parties has yet been reached. The Sámi have contested the ownership by the Finnish State of lands within the Sámi homelands. Reports have been prepared on the land ownership question, but there are still considerable differences of opinion regarding their conclusions.

Most of the Sámi homelands consist of protected areas or wilderness areas. The basic principles of nature conservation in these areas are consistent with the objectives of safeguarding the continuity of Sámi cultures and traditional livelihoods. Co-operation between the nature conservation authorities and the Sámi Parliament is regular, open and close, and no major conflicts have arisen in practice. The unclear situation as to land ownership nevertheless causes continual problems in planning the management and use of areas and in their administration, as the nature conservation administration operates within the prevailing legal framework, while the views of the Sámi Parliament are consistently based on its opinion that ownership of the Sámi homelands by the Finnish State is illegal. The land rights issue also forms the background to many disputes on the use of natural resources in the Sámi homelands, the repercussions of which may even jeopardise sustainable development within this region.

Challenges

An administrative model enjoying the broad approval of various parties is currently under development that will safeguard the rights of the Sámi as an indigenous people as required by the spirit of the Finnish Constitution and

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ILO Convention no. 169. The conditions for Sámi culture will continue to be safeguarded as a universal principle in various sectors. While the various ways in which the Sámi culture uses the environment include a great deal of traditional and empirical knowledge of using a northerly environment, this information has not been systematically stored, nor can it be used in conserving and managing biodiversity. The threat posed by climate change to the northern environment is also a serious threat to the future of freely grazing reindeer husbandry, which is the foundation of the Sámi culture.

Objectives

The traditional Sámi way of life and culture should continue to be promoted within the Sámi homelands, and the northern biodiversity on which these cultures are based should be conserved.

Measures

89) Legislative amendments designed to safeguard the conditions for Sámi culture will continue in order to harmonise the management, use and conservation of natural resources in the Sámi homelands.

• MJ, MAF, 2006-2008

90) An administrative model that enables Sámi rights of land ownership and possession will be established, securing the rights of the Sámi as an indigenous people to maintain and develop their culture while also allowing for other local rights and conditions, and the needs to develop them. • MJ, MAF, 2008-2010

91) Conditions will be established for recording and applying traditional Sámi knowledge of biodiversity to promote the sustainable use of the natural resources of the Sámi homelands, with regard to the principles of the CBD concerning traditional knowledge. • MJ, MEd, MAF, MEnv, 2008-2010

Promoting research and managing biodiversity data

Background

In recent years there has been a considerable increase in research findings on the state of and trends in Finnish biodiversity and of means of maintaining biodiversity and their effectiveness. Important related research projects and reports include:

- Assessment of the representativeness of Finland's protected areas network (SAVA), 1997-2002 (Finnish Environment Institute, MEnv)
- Finnish biodiversity research programme (FIBRE), 1997-2002, and its development project BITUMI (Academy of Finland, MEd)
- Report of the working group on forest conservation needs in Southern Finland and Ostrobothnia (ESSU), 1999-2000 (MEnv)
- Finnish Biodiversity and Monitoring Programme (MOSSE), 2003-2006 (MAF and MEnv)
- Research programme within the METSO Programme on inadequately known and threatened forest species (PUTTE) (MEnv)
- Baltic Sea conservation research programme (BIREME), 2002-2005 (Academy of Finland, MEd)
- Finnish Inventory Programme for the Underwater Marine Environment (VELMU), 2003-2014 (MEnv)
- Ability of the Finnish environment and society to adapt to climate change (FINADAPT), 2004-2005, (Finnish Environment Institute, MEnv)

- Safeguarding forest biodiversity - policy instruments and socio-economic impacts (TUK), 2005-2010 (Finnish Forest Research Institute, MAF)

The work done on these projects means that a large number of researchers and specialists now have experience in this sector. Their knowledge and skills may be used in future for resolving ever more challenging problems in biodiversity research, and for producing research findings to meet the needs of operators in the sector more comprehensively.

Planning, guidance and practical implementation of conservation and management of organisms and biotopes requires up-to-date information. Several parties working under the direction of various ministries are responsible for providing information on biodiversity in Finland. Data on natural resources is gathered for various purposes and administered under the guidance of the Ministry of Agriculture and Forestry, while other information on biodiversity is produced at universities and science museums under the guidance of the Ministry of Education, and in the administrative sphere of the Ministry of the Environment. The Finnish Institute of Marine Research produces considerable amounts of data on marine ecosystems. Finland's national CBD clearing-house mechanism LUMONET was established to serve the information needs of the CBD, the national action plan for its implementation, interest groups and other interested parties on issues related to the conservation, management and maintenance of biodiversity.

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Current situation

Due to varying practices in procuring and maintaining information, the use of such data is hampered by the existence of various data formats, by the varying accuracy and content of data, and by problems of access. So far the only authorities with access to the species section of the Hertta environmental database are the environmental administration and Metsähallitus. The SUTIGIS system developed for administering regional information produced by Metsähallitus can currently be accessed only at Metsähallitus's own offices. Details of science museum collections and various research findings are largely decentralised, and stored in forms that do not allow access through data systems. Furthermore, the body of available information for many biodiversity topics is scarce or haphazard, and in some areas no data collection has been arranged at all. There are also problems related to the provision of compiled information for use by local or regional land use planners. The biodiversity data from environmental impact assessments represents an important potential source of information, but such material is not yet readily available.

Challenges

Although basic research into conservation ecology and other aspects of biodiversity remains important for enhancing knowledge and sector applications, the practical application of basic research is problematic due to the fragmented nature of research topics and the provisional character of findings. Transmission of research findings to policymakers and dialogue between researchers and us-

ers of information also remain inadequate. Social science and multidisciplinary approaches to biodiversity research are necessary to resolve the extensive societal problems ahead.

The principal disconnected environmental and natural resource data systems should be reformed to enable access by all the parties who need such information. The systems for collating observations of expert amateur naturalists to provide biodiversity monitoring data must also be harmonised, and the information compiled in this way must be made widely available. Information materials provided by various parties could be placed in the public domain through the LUMONET portal. Time series data are also required on common organisms and biotopes, for example to help identify, monitor and combat threats arising from climate change and harmful alien species. Biodiversity data from environmental impact assessments should be stored in information systems open to various users.

Objectives

Our knowledge of biodiversity in Finland and the factors that affect it should be increased. Co-operation and the exchange of information between researchers, public authorities and other actors should be enhanced.

Information on biodiversity should be organised to allow easy access regardless of where or by whom the data was collected. Care must be taken to ensure the high standard of information maintained by various parties, and to share access to data systems with other information providers. The national LUMONET service should be developed into a common portal for collecting and dis-

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seminating information on the natural environment that will improve the availability and serviceability of information regardless of the client's location.

Measures

92) The financial conditions for multidisciplinary biodiversity research programme from 2008 onwards will be investigated.

• MEd, MEnv, MAF, 2008-2016

93) Research projects will pay particular attention to improving interaction between researchers, policymakers and other users of information. • MEd, MEnv, MAF, 2006-2016

94) Administration of research findings on biodiversity will be organised on the networking principle in association with all parties participating in biodiversity research and monitoring. All information on biodiversity produced with support from public funds should become universally available at minimal cost.

• MEnv, MEd, MAF, MTI, MTC, 2007-2010

95) The LUMONET clearing house service will be developed into a portal that gathers and disseminates environmental information provided by various parties, and guidance in using the system will be provided for various administrative sectors. • MEnv, 2007-2010



International measures supporting the implementation of the CBD

Co-operation between multilateral environmental agreements and processes

Current situation

The earliest agreements on biodiversity, such as the Ramsar Convention on Wetlands (1971) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973) sought to implement conventional nature conservation, i.e. the conservation of organisms and habitats. Since then the conservation of biodiversity has broadened in scope to include sustainable use and biosafety. The CBD, which was signed in 1992 in connection with the United Nations Conference on Environment and Development (UNCED, Rio de Janeiro, 1992), and its implementation have given rise to an advanced concept of biodiversity as an essential element of

sustainable development and the provider of ecosystem services. At the same time the importance of biodiversity for combating global socioeconomic threats such as poverty in the developing countries has also grown (United Nations Millennium Declaration, Millennium Development Goals, 2000; Millennium summit progress report 2005).

Finland is a party to all of the global and regional international conventions and processes that affect Finland in which the conservation and sustainable use of biodiversity are significant objectives. Finland takes part in policymaking within the decisionmaking organs of these conventions and processes, usually in co-ordination with other EU member states. The expansion of the concept of biodiversity conservation has affected Finland's work in international conventions, and led to progress in, and support for co-operation between the multilateral environmental treaties and processes. This process, which reflects trends in international environmental and development policy, is also manifest in practice through Finland's

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development co-operation work and in regional work and co-operation with neighbouring countries.

Through various initiatives such as 'twinning projects' with Estonia and Hungary, Finland has provided expert assistance to countries in Eastern Europe and the Baltic States as they prepared for accession to the EU. Finnish experiences have also been shared with the nature conservation authorities of states that are currently at the harmonisation stage. Close co-operation in implementing Community Law and exchanges of specialists and experience are valuable both to Finland and to partner countries in Eastern Europe.

In recent years there has been discussion of the synergy benefits arising between multilateral environmental agreements (MEA) and the opportunities available from co-operation between agreements. The key MEAs (the CBD, UNFCCC, the UNCCD and the UN Forum on Forests) that arose from the UNCED conference at Rio de Janeiro in 1992 vary considerably in many respects. There are nevertheless many similarities and mutually supporting features in their objectives. Implementing the CBD can, for example, strengthen the ability of the Parties to adapt to climate change and mitigate the environmental changes that threaten food production and impoverished populations in dry regions of developing countries. A co-operation body of the Convention Secretariats is considering the practical opportunities for co-operation between the three Rio Conventions in question.

Finland has supported international co-operation to promote synergies between multilateral environmental agreements. In early autumn 2005 the Environment Committee of the Finnish Parliament organised a seminar with

the aid of the Ministry of the Environment to consider synergies under the Rio Conventions. In association with the OECD, the Ministry of the Environment arranged a conference in Helsinki in summer 2005 to consider ways of encouraging private investment to promote the implementation of the Rio Conventions. Finland has also assisted the work of the Ad-hoc Technical Expert Group (AHTEG) in considering the connections between the CBD and the UNFCCC. The latest meeting of this group was held in Finland in September 2005, resulting in publication of a report on the links between climate change and biodiversity. At national level the co-operation between conventions has been promoted through such initiatives as 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 will be important in future to ensure that the implementation of environmental agreements is well integrated into both national and international sustainable development strategies.

In the context of international co-operation on forests, the conservation of biodiversity is included in the work of the UN Forum on Forests. A total of 14 international forest-related organisations support the Forum's work through the Collaborative Partnership on Forests (CPF), including the CBD Secretariat. CPF initiatives cover issues including the harmonisation of official definitions related to forests, the co-ordination of reporting on forest issues, and the use of forest research to support policymakers. Finland has supported several joint CPF projects.

The conservation of biodiversity is an essential ele-

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ment in the European forest co-operation and the preparatory and monitoring work of the Ministerial Conferences on the Protection of Forests in Europe (MCPFE). Many European organisations also participate actively in this co-operation. The MCPFEs were launched in 1990 through a Finnish-French initiative.

The cost-efficiency of the various international agreements related to natural resources must be purposefully improved. Convention Secretariats should 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.

Challenges

The goal of significantly reducing the rate of biodiversity loss is highly demanding, and efforts to achieve this goal should be supported. The longterm objective should be to halt the loss of biodiversity globally.

Increasing collaboration and dialogue between the sectors working to implement the various multilateral environmental agreements and processes is a substantial and important challenge. The goal of halting the loss of biodiversity must be integrated into work under other conventions and processes, and mutually supporting international co-operation between conventions and processes should be promoted and improved.

Objectives

Finland should exert influence through international conventions, processes and other fora in order to ensure the achievement of the global goal of significantly reducing the current rate of loss of biodiversity.

Co-operation should be improved, not only by harmonising the objectives of multilateral environmental agreements and processes, but also through foreign policy measures in general, and particularly in support functions for developing countries. Co-operation between EU member states on the conservation of biodiversity should be reinforced, especially in the Eastern European region of importance for Finland.

Measures

96) Co-operation between the CBD and other multilateral environmental agreements and processes will continue to be enhanced to obtain synergic benefits. Co-operation and synergies between multilateral environmental agreements in the work of the Global Environment Facility (GEF) will be promoted. • MFA, MEnv, MAF, 2006-2010

97) Synergic benefits between multilateral environmental agreements and processes will be exploited in Finland's foreign policy measures, particularly in bilateral and multilateral development co-operation work and in collaboration in the Arctic Region. Initiatives of this kind include streamlining Convention reporting, building capacity for the implementation of conventions in developing countries, and taking into account the objectives of environmental conventions and processes when preparing and implementing strategies and instruments to guide development co-operation work, and in development financing.

• MFA, MEnv, 2007-2016

98) The conservation and sustainable use of biodiversity in forest habitats will be promoted through international forest initiatives. Efforts to set up a supporting intergovernmental agreement related to forests will be supported.

- MFA, MAF, MEnv, 2007-2016

99) Effective partnerships, exchanges of experts and sharing of experience will be enhanced with EU member states in Eastern Europe, and the work of pre-accession countries to implement Community Law on biodiversity will be supported.

- MFA, MEnv, MAF, 2006-2016

Development co-operation and technology transfer

Background

International environmental conventions impose common but differentiated responsibilities and various duties on their signatory parties. The industrialised countries have a duty to help the developing countries to meet their own obligations, for example by supporting capacity building and promoting the transfer of technology. The Finnish government's development policy programme of 2004 also refers to the need to support developing countries' efforts to meet their obligations under environmental conventions. This policy indicates that environmental affairs should be integrated as a crosscutting theme in Finland's development co-operation work. The sustainable use of biodiversity, especially through functional ecosystem services, is considered to be particularly important for the livelihoods of poorer groups within developing countries. By providing means of livelihood, ensuring health, providing food security and safeguarding against catastrophes, ecosystem services are a fundamental factor behind nearly all of the UN millennium development goals. This means that biodiversity is very broadly linked to development as a whole, and not merely to the environmental aspects of sustainable development.

Current situation

A study (2005) conducted for the Ministry for Foreign Affairs and the Ministry of the Environment indicates that

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funding of development co-operation projects linked to biodiversity has increased to some extent in recent years. The most important such project supports the planning of the sustainable use of biodiversity in Peru's Amazon Region. The sustainable use of biodiversity is an important factor in many environmental sector development co-operation projects supporting the work of environmental authorities in countries including South Africa, Nicaragua, Mozambique and Kyrgyzstan. This also applies to forestry projects supported by Finland in Tanzania, Mozambique, Zambia and elsewhere. Funds channelled through the Global Environment Facility (GEF) play an important role in multilateral financing. About 33% of total financing from this source is allocated to work in support of the CBD.

Challenges

An evaluation of Finland's environmental sector's development co-operation work was completed in spring 2006. This will form the basis for policy guidelines on development co-operation in the environmental sector currently being prepared by the Department for Development Policy within the Ministry for Foreign Affairs. The sustainable use of biodiversity should be incorporated as an important factor reducing poverty in the developing countries when preparing environmental sector policy guidelines for Finland's development policy.

Objectives

Finland's environmental sector's development co-operation work should be enhanced systematically and cost-

International measures supporting the implementation of the CBD and the programme of work on technology transfer

The programme of work on technology transfer and co-operation under the CBD (Decision VII/29) has four programme elements. Its operational targets are set out under objectives that correspond to these four elements.

1: Technology assessments

Objective: The technology needs, potential benefits, costs and risks of such technologies, and the related capacitybuilding needs of the Parties are identified in response to national priorities and policies.

2: Information systems

Objective: National, regional and international information systems for technology transfer and co-operation provide comprehensive information of relevance to foster technology transfer and technology co-operation.

3: Creating enabling environments

Objective: To identify and put in place institutional, administrative, legislative and policy frameworks conducive to private and public sector technology transfer and co-operation, also taking into account the existing work of relevant international organizations and initiatives.

4: Capacitybuilding and enhancement

Objective: Technical, scientific, institutional and administrative capacity is adequate for the effective co-operation, transfer, diffusion and adaptation of technology, as well as technical and scientific co-operation.

effectively to support the capacities of developing countries in the context of their objectives and actions related to the conservation, management and sustainable use of biodiversity.

Measures

100) The sustainable use of biodiversity will be incorporated as an important factor reducing poverty in the developing countries during the preparation of environmental sector policy guidelines for Finland's development policy. • MFA, 2007-2016

101) Finland will give due consideration to the objectives and obligations of environmental conventions in its development co-operation work. Environmental issues will be given prominence in bilateral relations with developing countries. A strategy will be formulated for promoting biodiversity projects financed as part of Finland's development co-operation work. Finland will actively participate in international negotiations under environmental conventions, and give due consideration to the special needs of developing countries in the negotiations and when implementing conventions. Efforts should also be made to consider the needs of developing countries when negotiating new conventions. • MFA, MEnv, MAF, 2006-2016

102) Efforts should be made to launch new development co-operation projects designed to alleviate poverty in developing countries through the sustainable use of biodiversity. • MFA, 2007-2016

103) Efforts should be made under biodiversity projects and programmes financed by the Ministry for Foreign Affairs to provide more opportunities for young experts to enrol for on-the-job training in international development projects and programmes in the sector. • MFA, 2007-2016

Regional co-operation

Background

Finland is obliged to contribute to the maintenance of biodiversity in the boreal region. The fate of the boreal environment in Northern Europe is also of particular importance for Finland. Finland has been particularly active in nature conservation co-operation with Russia, whose territory includes as much as 60% of the world's boreal forests. The extent of Russia's forest resources and the special features of its forested environment are unique, and include high levels of biodiversity in untouched old-growth forests.

Some of Russia's extensive oldgrowth forest regions are in the northwestern corner of the country near Finland, where there are increasing pressures to exploit forest resources. The fact that the Finnish pulp and paper industry is the largest importer of timber from NW Russia underscores Finland's involvement in and indirect responsibility for the sustainable use of Russia's forest resources. A balance must be achieved through national and international measures, ensuring the conservation of boreal biodiversity in Finland's neighbouring regions while enabling sustainable use of the natural environment. Promoting conservation within the Fennoscandian green belt of the Finnish-Russian border zone will be an important factor in co-operation to conserve biodiversity in these regions.

The southern coast of Finland constitutes part of a hemiboreal zone that also includes the Baltic Countries and southern parts of the Leningrad District. In order to

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maintain biodiversity in southern Finland, as well as the hemiboreal zone as a whole, it is important to co-operate in nature conservation work with Estonia and the other Baltic Countries. The common objectives of the EU regarding the maintenance of biodiversity also underscore the need for co-operation.

Finland, Russia and Estonia also share the common objective of maintaining the biodiversity of the marine environment in the Gulf of Finland. This issue must be given greater prominence as an area for co-operation in the near future alongside other important environmental protection issues in the Gulf of Finland. Co-operation between Finland and Estonia will also be required when preparing marine areas for the Natura 2000 network.

Current situation

The history of nature conservation co-operation between Finland and Russia dates back to the 1970s. Developing the Fennoscandian green belt and conserving biodiversity in the border zone has been an important agenda since the end of the 1980s.

Since 1997 Finland has financed a development programme for sustainable forestry and biodiversity conservation in Northwest Russia, implemented jointly on a project basis by the Finnish Ministry for Foreign Affairs, the Ministry of the Environment and the Ministry of Agriculture and Forestry. Forestry projects within this programme are financed and co-ordinated by the Ministry of Agriculture and Forestry. Nature conservation projects are financed by the Ministry of the Environment and co-ordinated by the Finnish Environment Institute. Nature

conservation projects are under way in NW Russia in the Republic of Karelia, Archangel, Murmansk, Vologda and the Leningrad District, and also in the city of St Petersburg. So far 47 projects have been completed under the programme.

The nature conservation projects within this programme have already had a favourable impact on the establishment of new protected areas and on the development of the protected area network in NW Russia. The most important outcome was the decision to establish Kalevala National Park made in August 2002 by the government of the Republic of Karelia. Collaboration projects have also helped to support nature conservation research, which is essential for determining the ecological and economic grounds for decisions on the designation of local protected areas. Joint specialist seminars and negotiations have been arranged annually both in Finland and in Russia. The programme has also supported scientific publications produced by Russian partners to promote nature conservation.

One innovative element of the programme of joint projects in NW Russia is the international project "GAP analysis – assessment of the representativeness of and gaps in the protected areas network of Northwest Russia", which involves an inventory of the environmental values of existing and planned protected areas, conservation planning, and assessment and analysis of land use. Improvements have also been planned for the use of GIS.

With funding from the Ministry of the Environment, Metsähallitus has particularly been working to improve co-operation between protected areas with a view to establishing a chain of international partner parks along the

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Finnish-Russian border. Work on this network has also benefited from EU funding programmes.

The Fennoscandian green belt and the enhancement of conservation measures have lately been the focus of attention, particularly due to recent initiatives by Russian specialists and NGOs. Efforts will be made to seek inclusion of already protected sections of the valuable Fennoscandian green belt between Finland and Russia in the UNESCO World Heritage List. International consultations have also begun on extending the green belt from Fennoscandia through Central and Eastern Europe all the way to the Balkans.

Co-operation on nature conservation has been part of bilateral environmental protection co-operation between Finland and Estonia. Attention has focused in recent years on the duties arising from Estonian accession to the EU, with Finland sharing its own corresponding experiences in this context. Co-operation and exchanges of information between Finnish and Estonian specialists have benefited nature conservation in both countries. Co-operation has also been close between Finland's Metsähallitus organisation and protected areas in Estonia. Bilateral nature conservation co-operation between Finland and Estonia and between Finland and Russia is now expanding into trilateral co-operation between all three countries, particularly with respect to the marine environment of the Gulf of Finland.

Finland, Sweden and Norway have long been engaged in bilateral nature conservation projects of their own in Northwest Russia. The International Contact Forum on Habitat Conservation in the Barents Region (HCF) was set up in 1999 to enhance and co-ordinate

this co-operation. The HCF is an unofficial part of the work of the Barents Euro-Arctic Council's environmental working group.

The working committees, working groups and financing instruments of the Nordic Council of Ministers together form a permanent co-operation framework for promoting biodiversity not only in the Nordic Countries, but also in the Baltic Countries and Russia. The Nordic-Baltic section of the EUROPARC Federation also serves as a forum enabling collaboration between the public authorities responsible for protected areas.

Finland is actively involved in the work of the Arctic Council Conservation of Arctic Flora and Fauna (CAFF) working group, which aims to conserve the circumpolar environment. Finland chairs this working group over the period 2005-2006. The current CAFF work programme incorporates a diverse range of projects aimed at Arctic avifauna, with particular attention to seabirds, as well as vegetation and protected areas. Practical preparations for implementing the extensive circumpolar biodiversity monitoring programme of CAFF (CBMP) began in autumn 2005 under Canadian direction, and this will be the working group's single most important inhouse project over the next few years. Another important upcoming CAFF initiative will be the ACIA project, an extensive investigation of the impacts of climate change on the Arctic region conducted under the ambit of the Arctic Council. The ACIA scientific report will provide a foundation for practical proposals from CAFF for measures to conserve biodiversity in the Arctic.

Challenges

Safeguarding the viability of species' populations in Finland will require measures not only in Finland, but also the conservation of migratory routes, particularly those leading into Russian territory, since populations of species in Russia often serve to reinforce populations in Finland. NW Russia has oldgrowth forests and other natural features that are unique by European standards and should be conserved.

Objectives

Finland should work with Russia to promote the establishment of an internationally representative network of protected areas in NW Russia, the enlargement and enhanced functioning of the Fennoscandian green belt protected area network, and the greater recognition of its international importance. The conservation of biodiversity should also be assured in the commercial exploitation of forests. Another objective is to achieve nature conservation targets defined for marine areas through the CBD programme of work on marine and coastal biodiversity, and the implementation of the EU Habitats Directive in the Gulf of Finland in association with other Member States. Up-to-date information and trend forecasts concerning the state of biodiversity in northern parts of the Fennoscandian region should be collected through the CBMP monitoring programme of the Arctic Council's CAFF working group.

Measures

104) Conservation of valuable natural areas will be promoted and the establishment of a chain of internationally twinned parks along the Finnish-Russian border will be supported, thereby providing an opportunity to harmonise the ecologically sustainable management and use of these protected areas.

• MEnv, 2006-2016

105) Preparations will be made where possible for including the Fennoscandian green belt of protected areas along the Finnish-Russian border in the UNESCO World Heritage List.

• MEnv, 2006-2010

106) Co-operation between Finland and Russia on nature conservation and forest issues in Northwest Russia will be enhanced.

• MEnv, MFA, 2006-2016

107) Finland will participate actively in the CBMP biodiversity monitoring programme of the Arctic Council's CAFF working group.

• MEnv, MFA, 2006-2016

108) Tripartite co-operation on biodiversity conservation will be initiated between Finland, Russia and Estonia.

• MEnv, MFA, 2006-2008



Implementation of the Biosafety Protocol

Background

The Cartagena Protocol on Biosafety is a new type of environmental convention appended to the CBD.

Current situation

The Biosafety Protocol took effect on 11 September 2003 internationally, and on 17 October 2004 in Finland. It has so far been ratified by 124 States and by the European Community.

Challenges

Global growth in the use of genetically modified organisms (GMOs) has led to a need to regulate their use and their transfer between countries. In accordance with the precautionary principle, the Biosafety Protocol seeks to ensure that living GMOs are transferred, handled and used in a manner that causes no harm to biodiversity or to the sustainable use thereof, particularly where such transfers cross international borders. The Biosafety Protocol

also gives consideration to human health risks. The Protocol is particularly important to developing and transition economy countries, where it may be used to enhance and support administration, legislation and research regarding biosafety. Documentation and identification requirements for international transfers and comprehensive risk assessment and management are fundamental elements of import control.

Objectives

Finland should play an active role in enhancing and implementing the Biosafety Protocol.

Measures

109) International rules and regulations on the handling, transportation, packing and identification of genetically modified organisms will be formulated and adopted under the scope of the Biosafety Protocol, together with associated risk assessment, risk management, liability and damage compensation procedures. • MSAH, MEnv, 2006-2016



Monitoring

Background

The monitoring of the state of biodiversity and current trends includes the collection of information on the changes taking place in ecosystems and habitats, species and species communities, and genes and genotypes. Such monitoring data is of irreplaceable value in the effective evaluation and planning of measures to conserve biodiversity. Monitoring databases are also necessary for obligatory reporting procedures related to EU legislation and international agreements.

Current situation

The monitoring group of the National Action Plan for Biodiversity 1997-2005 made progress reports on the implementation of the plan at 2-year intervals. The overall impacts of the plan were assessed in a separate evaluation report, which also presented an evaluation of the current state of biodiversity in Finland and trends in threatened

species until 2010, as well as assessments of the changes occurring in various habitats.

The report pointed out that such assessments of the state of biodiversity and future changes are hampered by the lack of up-to-date monitoring information, even though several monitoring projects are already producing data on the state of biodiversity in Finland and current trends.

According to the expert working group focussing on research, monitoring and information systems (TST working group) that works under the monitoring group of the National Action Plan, more than 60 ongoing Finnish monitoring schemes currently provide data related to biodiversity. These existing schemes provide a good basis for the future organisation of biodiversity monitoring, even if some of the schemes need to be improved and new schemes still need to be set up for insufficiently monitored aspects of biodiversity.

Observations submitted on a voluntary basis play a significant role in biodiversity monitoring in Finland

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– accounting in some species monitoring schemes for as much as 70% of all observations. This type of voluntary work is a valuable resource, but in certain cases it also gives rise to challenges when striving to make monitoring schemes more scientific. Some schemes have been set up through the initiatives of individual researchers, and their continuity may not be guaranteed indefinitely. Because of such aspects of existing monitoring schemes, it is also necessary to consider ways to ensure their continuity.

Challenges

Monitoring and evaluating the state of biodiversity has been taking on an increasingly important role due to the objectives of the CBD and EU biodiversity policies with regard to the need to halt the ongoing decline in biodiversity by 2010. Indicators to be used for the purposes of monitoring progress towards this objective are currently being devised by many international stakeholders. These developments must also be considered as biodiversity monitoring is enhanced in Finland. Finland's criteria and indicators for sustainable forestry were renewed in 2006, providing a useful basis for future work.

Applicable indicators should be devised to measure the state of biodiversity, ongoing changes, current pressures, and the impacts of measures taken. Evaluations of the success of institutional arrangements are also needed.

Currently available monitoring databases enable some aspects of the state of biodiversity and ongoing changes to be evaluated accurately, but no comprehen-

sive assessments of the state of biodiversity or thematic summaries have as yet been compiled. Very few clear indicators of the overall state of biodiversity have been devised as yet. Significant problems hindering the development of monitoring schemes and reporting have included the relative lack of co-ordination between existing schemes, and deficiencies in the administration of existing databases.

To improve biodiversity monitoring, co-operation between the different parties involved in monitoring must be promoted, and the various biodiversity monitoring schemes must be urgently harmonised. This will serve to increase the usability of monitoring databases, encourage the common use of data, improve reporting on the state of biodiversity, and enhance monitoring work. Openly available databases should be compiled through networked co-operation covering monitoring schemes and the organisations that carry them out, as well as the resultant databases and reports.

Objectives

After Finland's new biodiversity strategy has been approved, it will be necessary to set up a widely based body to oversee its implementation and monitoring. It is important that this body should include representatives of all key actors from both the public and private sectors, from interest groups, and from nongovernmental organisations. This body will strive to agree on how the implementation of the strategy and action plan will be organised within the administration, and how various stakeholders can participate in these activities. In addition to monitoring the im-

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plementation of the strategy and action plan, this body will also be responsible for evaluating changes in the state of biodiversity, assessing the need to revise and redirect the strategy and action plan, and improving dialogues and mutual participation between different sectors of the administration and other actors.

An effective system should be set up for the monitoring and evaluation of trends in the state of biodiversity, also enabling the monitoring of the pressures that affect biodiversity and the impacts of biodiversity policies, using indicators devised for these purposes.

An effective system for monitoring the state of biodiversity and current trends should be set up by 2010.

Measures

110) An evaluation system will be set up to assess the effectiveness and impacts of the National Strategy and Action Plan. A networkbased monitoring and evaluation system focussing on the state of biodiversity in Finland and current trends will also be launched.

- MEnv, MFA, MI, MD, MEd, MAF, MTI, MSAH, MTC, ML, 2006-2007



Impacts of the Action Plan

One principle behind the preparation of the action plan has been that the measures it contains should be implementable within existing government budget frameworks. This means that funding can be channelled into the necessary measures during current budget framework period by reallocating existing resources. Consideration has also been given to the requirement of the governmental productivity programme that human resources can only be channelled into new tasks by reallocating resources within specific administrative sectors.

Some of the action plan's measures cannot be implemented without the significant reallocation of financial and human resources. Such measures particularly include the following actions to be taken within the administrative sector of the Ministry of the Environment:

28) Finland's coastal biodiversity will be assessed by completing the VELMU Inventory Programme for the Underwater Marine Environment by 2014.

The total costs of implementing this measure over the period 2006-2014 are expected to amount to about €6 million. Seven ministries are involved in the VELMU project in all, but the Ministry of the Environment has so far been responsible for most of the costs. Resources for this project can to some extent be allocated through management by results. Changes in the principles applied for the exchange of information collected using public finances could also help to avoid unnecessary impacts on budgets.

41) Conservation measures will be implemented by 2012 in areas within the Natura 2000 network to meet the objectives set out in the Habitats Directive. Where necessary, management plans will be drawn up together with stakeholders. The total costs of implementing this measure over the period 2006-2012 are expected to amount to about €15 million. Cost pressures arise in the context of existing budget frameworks

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wherever Natura 2000 sites are implemented by designating protected areas, since the funding needs of conservation programmes have not been fully considered in the drafting of current frameworks. In conserving Natura 2000 sites it is extremely important to exploit EU joint funding schemes such as Life+.

68) Ministries and other interest groups will work together to prepare and initiate a communications programme to improve the public awareness and social acceptability of the conservation of biodiversity and sustainable use of natural resources.

The total costs of this programme over the period 2007-2010 are expected to amount to about €2 million. The programme will be jointly realised by four ministries, but the Ministry of the Environment will bear the greatest responsibility for meeting the related costs. EU funding may also be used in this programme to some extent. The programme would be impossible to implement using the resources currently available to the Ministry of the Environment for communications purposes. Communications must build on the positive experiences obtained through cross-sectoral collaboration on communications for the METSO Forest Biodiversity Programme for Southern Finland, exploiting the co-operation built up between communications in the various sectors such as agriculture and forestry and biodiversity.

94) Administration of research findings on biodiversity will be organised on the networking principle in association with all parties participating in biodiversity research and monitoring. All information on biodiversity produced with support from public funds should become universally available at minimal cost. This initiative is to be realised through co-operation between five ministries, with the administrative sector of the Ministry of the Environment bearing the greatest responsibility for meeting the related costs. Improving the administration of biodiversity data is one of the most important measures within the nature conservation administration's productivity programme. The consequent urgency of this project means that funding amounting to some €2.5 million should be available for this work over the period 2007-2010.

In terms of the national budget the action plan's most significant measure is:

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. This work will mainly be carried out by the Ministry of the Environment and the Ministry of Agriculture and Forestry. A decision on the future funding of the METSO Programme will be made by the Government at the end of 2007. A review of the future of Finland's forest sector estimates the levels of funding needed annually for forest conservation within the administrative sectors of the Ministry of the Environment and the Ministry of Agriculture and Forestry at €50 million and €15 million, respectively.

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In 2005, the Ministry of the Environment spent a total of €49 million on the acquisition of land for protected areas and related compensation payments. This means that costs will not rise significantly overall, but that resources will mainly be used to protect forest habitats after the implementation of previous conservation policies is completed in 2009.

The measures specified above are especially crucial with regard to the implementation of Finland's national biodiversity strategy. The resources necessary for their realisation must therefore be found through all available means.

The action plan's measures have been defined on the basis of the national biodiversity strategy. The future challenges identified in the evaluation conducted during the years 2004-2005 of the National Action Plan for Biodiversity in Finland 1997-2005 have also been considered. Additionally, efforts have been made to convert the objectives and obligations defined in the CBD's programmes of work into practical measures. The action plan's own primary objectives – the conservation and sustainable use of biodiversity – clearly constitute favourable environmental impacts in themselves.

The conservation of biodiversity may have positive or negative impacts in terms of social, economic and cultural sustainability, and business prospects. Many of the means chosen for the action plan have been designed to avoid such negative side effects. Voluntary conservation measures, open and participative administrative procedures and the exploitation of economic opportunities provided by biodiversity all serve to counteract the tendency for the conservation of biodiversity to entail an end to cer-

tain usages of natural resources.

The measures within the action plan have been defined to allow flexibility in their implementation. This also allows the impacts of each measure to be evaluated separately and the identification of suitable means for their implementation, aiming to reduce harmful impacts and increase benefits.



Principles and Guidelines for the Sustainable Use of Biodiversity

(Addis Ababa, 2003)

Adopted at the 7th Conference of the Parties to the Convention on Biological Diversity (2004) (decision VII/12). Sustainability of use of biodiversity components will be enhanced if the following practical principles and related operational guidelines are applied:

Practical principle 1

Supportive policies, laws, and institutions are in place at all levels of governance and there are effective linkages between these levels.

Practical principle 2

Recognizing the need for a governing framework consistent with international/national laws, local users of biodiversity components should be sufficiently empowered and supported by rights to be responsible and accountable for use of the resources concerned.

Practical principle 3

International, national policies, laws and regulations that distort markets which contribute to habitat degradation or otherwise generate perverse incentives that undermine conservation and sustainable use of biodiversity, should be identified and removed or mitigated.

Practical principle 4

Adaptive management should be practiced, based on:

1. Science and traditional and local knowledge;
2. Iterative, timely and transparent feedback derived from monitoring the use, environmental, socioeconomic impacts, and the status of the resource being used; and
3. Adjusting management based on timely feedback from the monitoring procedures.

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Practical principle 5

Sustainable use management goals and practices should avoid or minimize adverse impacts on ecosystem services, structure and functions as well as other components of ecosystems.

Practical principle 6

Interdisciplinary research into all aspects of the use and conservation of biological diversity should be promoted and supported.

Practical principle 7

The spatial and temporal scale of management should be compatible with the ecological and socioeconomic scales of the use and its impact.

Practical principle 8

There should be arrangements for international cooperation where multinational decisionmaking and coordination are needed.

Practical principle 9

An interdisciplinary, participatory approach should be applied at the appropriate levels of management and governance related to the use.

Practical principle 10

International, national policies should take into account:

1. Current and potential values derived from the use of biological diversity;
2. Intrinsic and other non-economic values of biological diversity and
3. Market forces affecting the values and use.

Practical principle 11

Users of biodiversity components should seek to minimize waste and adverse environmental impact and optimize benefits from uses.

Practical principle 12

The needs of indigenous and local communities who live with and are affected by the use and conservation of biological diversity, along with their contributions to its conservation and sustainable use, should be reflected in the equitable distribution of the benefits from the use of those resources.

Practical principle 13

The costs of management and conservation of biological diversity should be internalized within the area of management and reflected in the distribution of the benefits from the use.

Practical principle 14

Education and public awareness programmes on conservation and sustainable use should be implemented and more effective methods of communications should be developed between and among stakeholders and managers.

Framework

for Monitoring Implementation of the Convention and Achievement of the 2010 Target: the Provisional Framework for Goals and Targets, Including Indicators (as adopted at COP 7 and COP8 of the CBD).

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 worlds ecological regions effectively conserved.

- Coverage of protected areas
- Trends in extent of selected biomes, ecosystems and habitats
- Trends in abundance and distribution of selected species

Target 1.2: Areas of particular importance to biodiversity protected

- Trends in extent of selected biomes, ecosystems and habitats
- Trends in abundance and distribution of selected species
- Coverage of protected areas

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.

- Trends in abundance and distribution of selected species
- Change in status of threatened species

Target 2.2: Status of threatened species improved.

- Change in status of threatened species
- Trends in abundance and distribution of selected species
- Coverage of protected areas

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.

- Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socioeconomic importance
- Biodiversity used in food and medicine(indicator under development)
- Trends in abundance and distribution of selected species

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 consistent with the conservation of biodiversity.

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- Area of forest, agricultural and aquaculture ecosystems under sustainable management
- Proportion of products derived from sustainable sources (indicator under development)
- Trends in abundance and distribution of selected species
- Marine trophic index
- Nitrogen deposition
- Water quality in aquatic ecosystems

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

- Ecological footprint and related concepts

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

- Change in status of threatened species

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.

- Trends in extent of selected biomes, ecosystems and habitats
- Trends in abundance and distribution of selected species
- Marine trophic index

Goal 6. Control threats from invasive alien species

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

- Trends in invasive alien species

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

- Trends in invasive alien species

Goal 7: Address challenges to biodiversity from climate change, and pollution

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

- Connectivity/fragmentation of ecosystems

Target 7.2. Reduce pollution and its impacts on biodiversity.

- Nitrogen deposition
- Water quality in aquatic ecosystems

Maintain goods and services from biodiversity to support human wellbeing

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

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

- Biodiversity used in food and medicine (indicator under development)
- Water quality in aquatic ecosystems
- Marine trophic index
- Incidence of Humaninduced ecosystem failure

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

- Health and wellbeing of communities who depend directly on local ecosystem goods and services
- Biodiversity used in food and medicine

Protect traditional knowledge, innovations and practices

Goal 9: Maintain sociocultural diversity of indigenous and local communities

Target 9.1. Protect traditional knowledge, innovations and practices.

- Status and trends of linguistic diversity and numbers of speakers of indigenous languages
- Additional indicators to be developed

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

- Indicator to be developed

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.

- Indicator to be developed

Target 10.2. Benefits arising from the commercial and other utilization 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

- Indicator to be developed

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.

- Official development assistance provided in support of the Convention

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.

- Indicator to be developed

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Saving nature for people, National strategy and action plan for conservation and sustainable use of biodiversity in Finland 2006-2016

Abstract

Biodiversity – the life on earth – refers to the variability among all living organisms on our planet. Biodiversity has influenced our cultural history and the identity of our nation and provides many direct and indirect benefits for society.

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

On 21st December 2006 the Finnish Government made the Decision-in-Principle on the National Strategy for the Conservation and Sustainable Use of Biodiversity 2006-2016. The decision contains longterm outlines for the conservation and sustainable use of biodiversity in Finland. The strategy aims to ensure the ecologically, economically and socially sustainable use and development of Finland's biodiversity and natural resources. This will safeguard favourable environmental conditions for people and the future prospects for livelihoods based on the use of natural resources, as well as the conservation of biodiversity. The National Strategy accompanied by an Action Plan for the conservation of biodiversity represent Finland's vision of and commitment for conservation and sustainable use of biodiversity. The NBSAP 2006-2016 in Finland has been drafted in line with article 6 of the CBD.

The goals of the National strategy and the Action plan for the conservation and sustainable use of biodiversity 2006 – 2016 are: to halt the decline in biodiversity in Finland by 2010, to establish favourable trends in the state of

the natural environment in Finland over the period 2010-2016, to prepare by 2016 for global environmental changes that may threaten the natural environment in Finland, particularly climate change, and to strengthen Finland's role in the preservation of biodiversity globally through international co-operation.

The EU Commission's Communication of "Halting the loss of biodiversity by 2010 – and beyond" outlines the EU objectives for four key biodiversity policy areas, and defines ten general objectives. The communication briefly reviews the state of biodiversity globally and within the EU, and also analyses current trends and their causes. The main aim of the Communication and its Action Plan is to integrate the conservation of biodiversity into other Community policies and to respond to the recent CBD call to prioritise actions to 2010. During the Finnish EU Presidency in the second half of 2006 Finland was responsible for the preparation of the EU Environment Council's conclusions on the Communication. The Council stressed in its conclusions the importance of effective implementation of the CBD and emphasized the importance of strengthening the implementation of NBSAP's.

The objectives and measures of the NBSAP to preserve biodiversity have already found interest in public at large. Thanks to increased research and monitoring, much more data is now available on biodiversity in Finland, enabling the establishment of a more detailed and more applicable knowledge base. This in turn provides a basis for changes in the way we act, and for increasing awareness and recognition of the value of biodiversity.

Keywords

Biological diversity, biodiversity, convention, nature conservation, sustainable use, environmental protection, climate change, access and benefit sharing, monitoring, environmental protection, indicators, research

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