

FIFTH NATIONAL REPORT TO THE CONVENTION ON BIOLOGICAL DIVERSITY FINLAND



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Ministry of the Environment



Biodiversity
ESSENTIAL TO LIFE

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FOREWORD / EXECUTIVE SUMMARY

On 20 December 2012, the Government adopted a resolution on the 2012–2020 strategy for the conservation and sustainable use of biodiversity in Finland. Entitled Saving Nature for People, this strategy has the key target of halting biodiversity loss in Finland by 2020. The National Strategy is being implemented – with a large number of activities not only by the state, but also by numerous dedicated actors in society.

This report to the CBD by Finland indicates a relatively strong commitment of all sectors and stakeholders to the implementation of the Convention on Biological Diversity (CBD). Throughout the report, we have reported on the latest developments including using examples (i.e., developments that have occurred since the last national report was prepared), on the progress made towards the Aichi Biodiversity Targets. We have used indicators and attempted to avoid repeating in detail what has been already covered in the 4th national report. This report makes it clear that progress has been made towards implementing the Aichi targets by 2020 and we are on schedule, although more efforts are required for meeting the targets set in Nagoya (See Part III of this report). It also shows, however, that there are targets which are more challenging because in the way they are formulated or their complex nature that affects different sectors of society at large.

The assessment of the status of and current trends in biodiversity in Finland reveals a mixed picture, however. In mires, alpine habitats, shores and rocky habitats the number of threatened species has been increasing. Forest biodiversity is no longer declining as rapidly as previously, but the overall declining trend has not yet been halted. In farmlands the overall changes have been slightly negative although some positive changes have also occurred. The only habitat type where most of the changes of threatened species were positive is urban areas. Nevertheless, in the case of species groups the situation has been positive and yet improving for dragonflies, bugs and beetles. Highest regional extension risk is, at the moment, for mammals, bryophytes and lichens. Eutrophication continues to be the main threat for the Baltic Sea. There seems to be a slight decreasing trend in the phosphorous loading even though the nutrient concentration has not decreased in the sea water.

By contrast, the trend analysis for the indicator set shows at large that both challenges and positive trends are foreseen. This means that in many areas we are moving in the right direction, but we are still a long way from achieving the strategy's targets. It is generally true to say that while many of the measures set out in the action areas of the National Biodiversity Strategy have been set in motion, in many cases the resulting positive effects have yet to make themselves concrete on the ground. This is partly due to the fact that it has not proved possible to reduce pressures sufficiently. One major factor, however, is that biotopes and populations of animal and plant species need long periods to regenerate, which means there is a considerable time-lag before results are reflected in the indicator figures. Improvements in population were noted in animal species such as the Saimaa ringed seal and the white-tailed eagle, and in plant species such as the lady's slipper orchid. More efforts are still needed to halt the decline in endangered habitat types, significantly improve their status and created a representative and functioning system of interlinked biotopes.

The 5th national report is based on our national indicator collection, that reflect not only the state of biodiversity, but also the pressures put on biodiversity and the actions taken in response to these. The overall development of the indicators and reporting of the trends have been evaluated and efforts have been made to integrate ecosystem services indicators into the framework. The national biodiversity indicator collection www.biodiversity.fi has been an important mechanism for measuring the status and trends of biodiversity work in Finland. The evaluation of the first NBSAP for 1997–2005 represented the first time that the state and development of Finland's biodiversity was assessed by using indicators. The set of national biodiversity indicators has subsequently been expanded and improved through on-going cooperation involving governmental research institutes, organizations and different stakeholders. The next mid-term assessment on the implementation of the NBSAP in Finland will take place in 2015 and reported to the Government.

Finland's biodiversity targets as approved by our Government in 2012, have been defined in line with the CBD strategic plan and the Aichi targets, with reference to conditions in Finland. The Government has assigned the

relevant ministries to implement the strategy by working together with civil society and other stakeholders. In part II of the report Finland's targets for 2020 are described.

For reporting and monitoring a lot of work is required for managing and improving the adequacy especially on the international and regional level. The information needs for traditional knowledge, ecosystem services and awareness building among other things needs a systematic way and approach to be successful. Our data and observation systems are relevant for reporting on the issues addressed in the Aichi target, including the use of the set of indicators approved and used on national level. The Natura 2000 areas form the backbone of Finland's network of protected areas.

Ecosystem services are the benefits obtained by people from nature. They can be divided into three categories: provisioning services, regulating and maintenance services and cultural services. Biodiversity forms the basis for ecosystem services, but there are also many important ecosystem services whose relationship to biodiversity has not yet been sufficiently studied. Attitudes to and awareness of ecosystem services and the relationship to biodiversity and human well-being needs emphasizes on different levels. Target differs from the majority of the other targets in its reliance on social data. For assessing awareness of biodiversity in a representative way requires efforts and new knowledge.

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

The global-level commitments and efforts to strengthen the implementation of the CBD have to be realized on both national and regional levels. National Biodiversity Strategies and Action Plans are therefore of highest importance. The National Action Plan for Biodiversity in Finland for 2013–2020 builds on our National Biodiversity Strategy 2012-2020 and agreed actions to implement the CBD through our Working group on promoting the implementation and monitoring of our national NBSAP. This report has been approved by this broadly-based working group.

One of the crucial objectives of our national work is to improve the effective communication of issues related to the conservation and sustainable use of biodiversity. The Convention has not yet received enough public or political recognition. Only by raising public awareness, and with the support of public opinion and the broad participation of all relevant stakeholders in preparing and implementing conservation and sustainable use actions, can we improve our commitment to the sound implementation of the Convention.

The proposal for Finland's National Strategy on Invasive Alien Species was prepared in collaboration between a broadly-based working group and experts, involving a total of more than 100 people. The objective of Finland's National Strategy on Invasive Alien Species is to minimize the threat and damage caused by invasive alien species, both those already present in Finland and the potential ones. The aim is to take action at the earliest stage possible to combat invasive alien species, because this is the most effective and far less costly approach to prevent damages caused by IAS.

Biodiversity cannot be safeguarded by traditional nature conservation measures alone. The input of society as a whole is required. The strategy places economic and cultural values related to biodiversity at the heart of decision-making on the use of natural resources. Particular attention is paid to sustainable use of natural resources. The use of renewable resources should be increased in a sustainable way and the sustainability of the usage should also be strengthened. Non-renewable resources should be used as eco-efficiently as possible.

The European Commission Communication in 2011, "Our life insurance, our natural capital: an EU biodiversity strategy to 2020" is important for the implementation of the biodiversity requirements for Finland as an EU Member state. The aim is: "By 2050, European Union biodiversity and the ecosystem services it provides — its natural capital — are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by

the loss of biodiversity are avoided". For rivers, lakes and groundwater the preparation of the first management plans and programmes of measures in response to the EU Water Framework Directive in 2009 was a step towards improving biological diversity in bodies of water. The aim is good chemical and ecological status of surface waters, and good chemical and quantitative status in the case of groundwater. Good ecological status is defined in terms of the species occurring naturally in a body of water.

The assessment and valuation of the services provided by ecosystems will play a vital role in the future monitoring of progress towards the objectives defined at Nagoya. Research findings and the development of assessment methods will be needed for this purpose. There is also a need to develop suitable indicators to describe ecosystem services and related trends. Recognizing, valuing and conserving biodiversity and awareness of ecosystem services are important. Decision-making related to biodiversity is greatly dependent on scientific research, data storage and management, and monitoring, since many issues involve complex cause and effect relationships. Finland's active involvement in the work of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) is an important way to ensure that a suitable knowledge base is available to support policy decisions on biodiversity at the national and international levels. Finland stresses the importance of the upcoming work, in contributing to assessments of the achievement of the Aichi Biodiversity Targets. The international TEEB study (The Economics of Ecosystems and Biodiversity) and the Finnish national TEEB study started in 2013 are intended to help raise awareness of the many and varied services and assets of nature and sustainable use. Business and industry is increasingly turning their attention to the issue of biological diversity. Nevertheless, the success stories contrast with persistent pressures on biological diversity. Only if we succeed in implementing the successful solutions on a large scale will it be possible to achieve the objectives of the National Strategy on Biological Diversity. When it comes to resource mobilisation Finland has reported twice (in years 2012 and 2014) on the results. More information can be found in Part II and Part III of this report.

We must also demonstrate the important role biodiversity can play in opening up new economic opportunities and in the efforts to eradicate poverty. The logo "Biodiversity – Essential to Life" illustrates our common commitment to halting the loss of biodiversity. Our logo is found on the cover of this report. The UN Decade on Biological Diversity is an important milestone for the future generations and to raise awareness of biodiversity.

PART I:
BIODIVERSITY STATUS,
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PART I:

BIODIVERSITY STATUS, TRENDS AND THREATS AND IMPLICATIONS FOR HUMAN WELL-BEING

IMPORTANCE OF BIODIVERSITY AND ECOSYSTEM SERVICES TO HUMAN WELL-BEING AND SOCIO-ECONOMIC DEVELOPMENT

Q1: Why is biodiversity important for your country?

As a sparsely populated northern European country Finland continues to rely on biodiversity and ecosystems services for stable social development and economic prosperity. The role of the use of natural resources has been quintessential in the nation's development and Finns have traditionally had a direct experiential relationship with nature. However, the nature of the dependence on nature and its services is changing.

The importance of provisioning services is slightly in decline even though their economic importance continues to be significant for Finland. Regulating ecosystem services and their relevance for society at large are at the moment being studied intensively. For example, the role of forest and mire ecosystems in storing carbon and thus mitigating climate change is proving to be substantial.

The cultural ecosystem services are becoming more important, also economically. The beneficial impacts of natural environments on health are becoming more obvious as research on these advances and various kinds of outdoor activities are growing in popularity. Besides relying on ecosystem services, many Finns also revere and cherish nature for its intrinsic values as is underlined by the increasing numbers of nature enthusiasts and the high level of biodiversity expertise in the country, for example.

The following section has been organised according to different ecosystem service categories and themes related to them: interaction, markets and health impacts. Work on national ecosystem service indicators is underway in Finland. A tentative list of indicator headlines can be retrieved from

1.1.1 Provisioning services

Finnish economy has traditionally relied on such provisioning services as roundwood and agricultural products: cultivated crops, meat and dairy products. The role of the forest sector has been particularly considerable in nation's post-war development, and it is still of utmost importance. During the past decades there have been, however, changes in this respect. For example, between 1975 and 2012 the share of the forest sector of Finland's GDP decreased from 9.5% to 4.0% and the share of agriculture from 5.6% to 1.0% (Fig. 1 A).

Despite the decreasing trends, forest industry products continue to constitute a large portion of Finland's exports. The total value of exported forest products has varied between 9 and 13 billion euros in 1996–2013 and the share of forest industry products of total exports now lies at 20% (Fig. 1 B). More than 60% of forest land is owned by 632 000 private forest owners and the whole sector provides employment directly and indirectly for 160 000 employees. The real gross stumpage earnings of private forest owners have typically varied between 1500 and 2000 million euro during the last decades. Also agriculture has been under structural changes during the last decades as the number of farms has been decreasing and the average size of farms increasing. Finnish agricultural production forms the basis of Finland's foodstuffs markets and food security and the country is primarily self-sufficient in terms of agricultural production. The agriculture employs 160 000 persons and the area under farming is 7% of the total surface area of Finland at the moment.

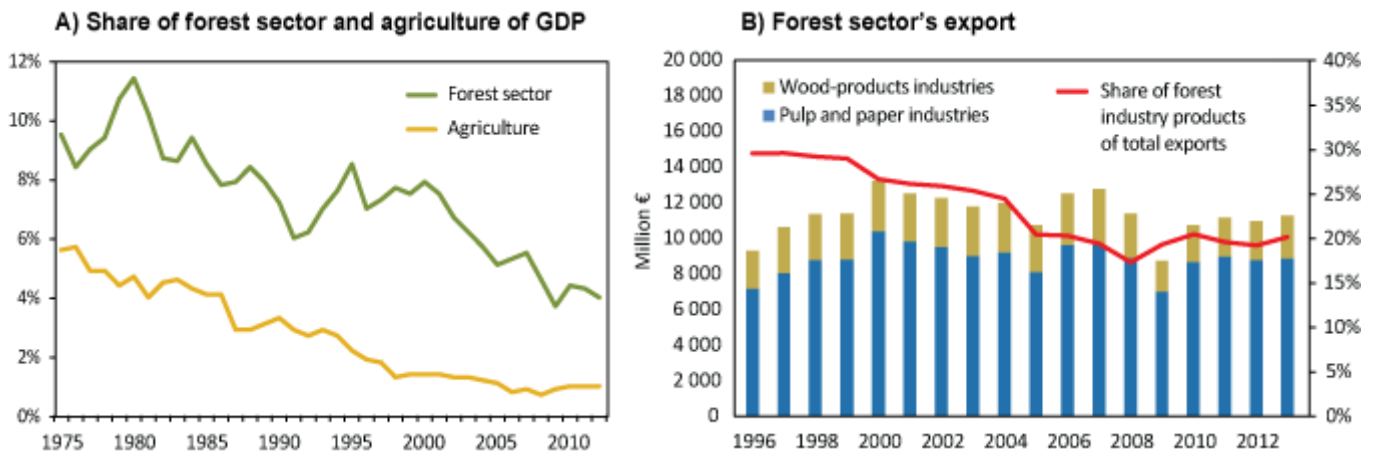


Figure 1. The share of the forest sector and agriculture of Finland's Gross Domestic Product 1975–2012 (A) and value of exports by forest industries and share of forest industry products of total exports 1996–2013 (B) ii. Sources: Statistics Finland and Finnish Forest Research Institute.

During the past decade Finnish forests have grown approximately 30% more in volume annually than the amount of wood removed from the forest as a result of roundwood removals and natural drain (Fig. 2). Most of the increase in the annual volume growth has been achieved through the draining of wooded mires, more intensive forest management as well as the fact that more forest stands now belong to the fastest growing young (30 to 60 year old) age classes. Although positive from the point of view of sustainable resource management, these changes have had mainly negative impacts on specialised forest and mire species.

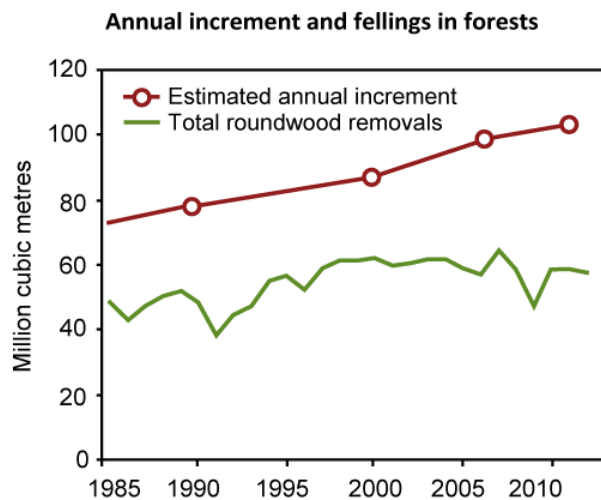


Figure 2. Estimated annual increment (volume growth) of Finnish forests and total roundwood removals (commercial roundwood removals and non-market household use of fuelwood and sawn timber) in 1985–2012. ⁱⁱⁱ In addition to total roundwood removals (57 million m³ in 2012) the total annual drain of wood (69 million m³) includes also 12 million m³ of uncollected logging residue and naturally decomposed wood. Source: Finnish Forest Research Institute.

On the level of the whole economy the direct economic importance of the use of other provisioning services such as fish, reindeer, game as well as natural berries and mushrooms is small and has mainly declined over the long term. However, these can still be locally important. A special group in terms of dependency on provisioning services are the indigenous Saami people for whose culture and livelihoods natural resources such as reindeer,

game and fish continue to play a major role. Most Saami living in the Saami Homeland in northern Lapland are either reindeer herders or have close family ties to reindeer herding.

One provisioning service with a contrary trend is the use of biomass for energy production. The majority of the biomass used for this purpose in Finland consists of wood and most of it is produced by forest-based industries as integral part of its processes. Because of climate targets there has been an increase especially in the use of forest chips for electricity and heat production since the turn of the millennium (Fig. 3 A). At the moment wood of all fuels covers 23% of the total energy consumption (Fig. 3 B). Peat is used mainly for heat generation. Its share of the total energy consumption is 5%. At the moment, 68 000 hectares peatland is under peat production and the peat production employs 9 000 persons. The future role of peat based energy is strongly debated due its negative impacts on biodiversity, water quality and climate change.

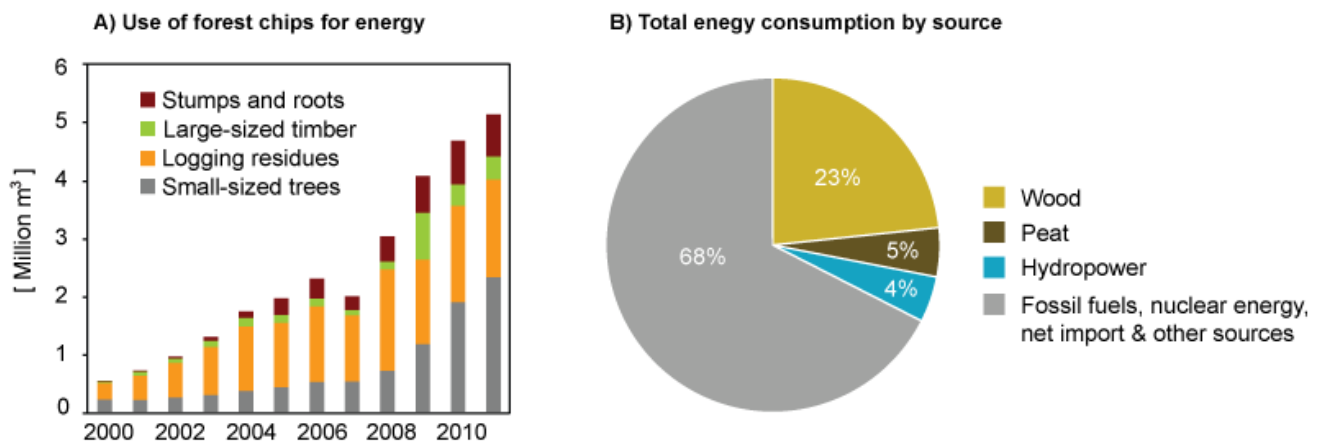


Figure 3. Use of forest chips for energy production 2000–2012 in heating and power plants (A)^{iv} and total energy consumption by source in 2012 (B)^v. Wood chips provide approximately one fifth of the total energy generated by the burning of wood fuels. The most important source of wood based energy is forest industry waste and by-products. Sources: Finnish Forest Research Institute and Statistics Finland.

1.1.2 Regulation and maintenance services

Together forests and mires (peatlands) cover 74% of Finland's land surface. Both of these contain a large carbon stock (Fig. 4 A). Finnish mires have accumulated 5 600 million tonnes of carbon as peat during their 10 000 year long history since the latest ice age. Forest land contains the second largest stock at 1 200 million tonnes of carbon. This stock, which consists of slowly decomposing forest litter and dead trees, is quite stable.

The 650 million tonnes of carbon stored in living trees is in a much more dynamic state. During the latest decades forests have functioned as carbon sinks as the growth of trees has exceeded the fellings (Fig. 2). The annual sequestration has been approximately 36 million tonnes CO²-eq in the 2000s. The forested area has also expanded since the 1950s because of intensive mire drainage. As a result, the carbon retention of trees has increased although, at the same time, this has decreased the stock of carbon in peatland. The farmland, on the other hand, has functioned as a carbon source. The annual release of carbon has remained quite stable during the latest decades at about 5 million tonnes CO²-eq. These calculations have, however, some defects such as ignoring the role of photosynthesis and yield levels of herbaceous crops as well as soil growth potential and tillage intensity. New carbon sequestration accounting methods are currently under development in European Union for LULUCF (land use, land use change and forestry) sector.

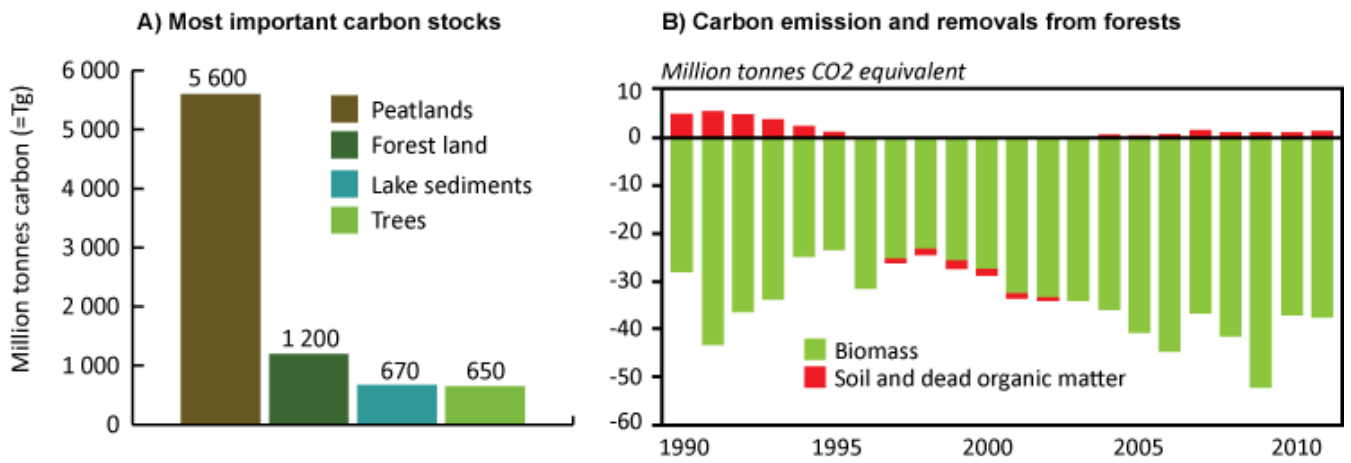


Figure 4. Most important carbon stocks in Finland (A)^{vi} and greenhouse gas emission and removals from the forest carbon stock 1990–2011 (B)^{vii}. Negative values indicate removals, positive emissions. Finnish Forest Research Institute.

Other important regulation and maintenance services in Finland include processes related to the cycling of water (see below) and nutrients (e.g. nitrogen fixation by certain plants, the retention of excess nutrients by vegetation), soil quality, pollination, and waste and toxin mediation. Some habitat types such as underwater eelgrass (*Zostera marina*) meadows and bladderwrack (*Fucus* spp.) communities as well as forested edges of open mires can also be regarded as performing important maintenance services as these provide nursery habitats for economically important species such as Baltic herring (*Clupea harengus membras*) and forest grouse species, respectively.

Comprehensive knowledge on most regulation and maintenance services is missing for the time being. Several ongoing research projects aim at filling in some of these knowledge gaps.^{viii}

1.1.3 Cultural services

The role of cultural services is becoming more important. In some cases the cultural significance of a certain activity related to utilising provisioning services can already outweigh its original purpose. It can be argued that in the cases of hunting, non-professional fishing and berry and mushroom picking, for example, the recreational and health benefits related to the activity are often more important than the value of the game bag, fish catch or berry yield.

Most of the nature in Finland is freely accessible to all on the basis of the everyman's right. Finland's legal concept of everyman's right gives everyone the chance to enjoy outdoor activities as long as it causes no harm to nature or property. The network of protected areas cover about 12.5% of the total surface area of Finland and especially national parks are widely used for recreation but commercially managed areas are equally important recreational sites for Finns, on the basis of the everyman's right.

According to Finnish Forest Research Institute nearly all Finns (96%) report taking part in outdoor activities.^{ix} On average, these are pursued two to three times a week resulting in a total of 170 outdoor recreation events per year. During a ten year period 2000 to 2010 the share of older people (65 to 74 years) engaging in outdoors activities increased in particular. More than half of the population walk, swim and cycle in nature, pick wild berries as well as spend time on the beach and summer cottage (Fig. 5 A). Fastest growing forms of outdoor activity include Nordic walking, running, recreational forest management and bird watching.

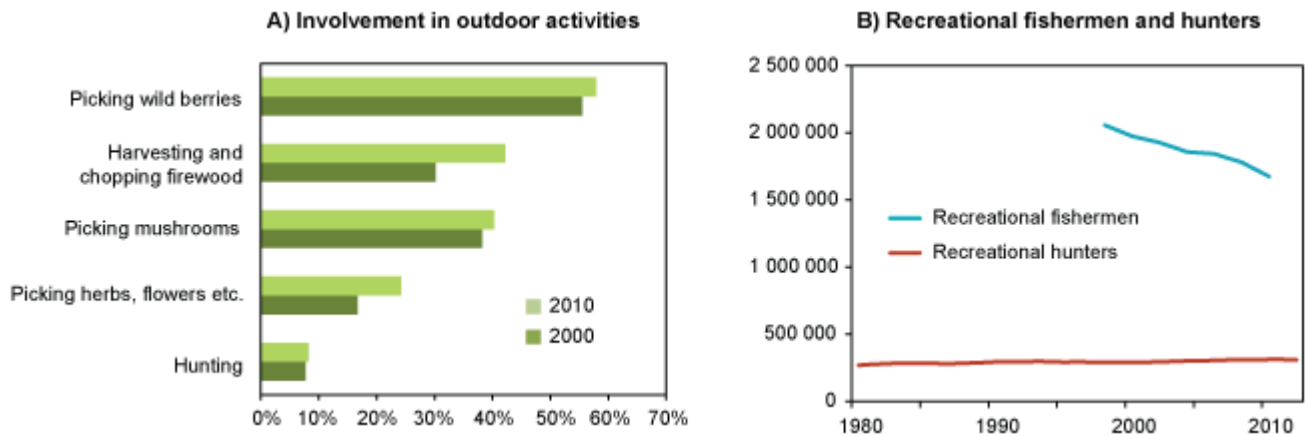


Figure 5. Involvement of adult population (15–74 years old) in outdoor activities (A)^x and number of recreational fishermen and hunters in Finland (B)^{xi}. The numbers of fishermen and hunters are based on survey and paid game management fees, respectively. Source: Finnish Forest Research Institute and Finnish Game and Fisheries Research Institute.

Besides picking berries and collecting mushroom – the two of which involve nearly half the population – recreational fishing and hunting are also popular among Finns (Fig. 5 B). On the basis of survey information, the number of people engaging in recreational fishing has been decreasing, but remains, nevertheless, quite high. More than 30% report fishing at least once a year. On the contrary, the number of hunters has been increasing quite steadily for the past decades and amounts to more than 300 000 Finns at the moment. Out of the many forms of hunting, the hunting of elk has probably the greatest impact on rural communities. Elk hunting involves organised elk hunting groups that often comprise a cross-section of the community, from teenagers to seniors, with the share of women increasing. Elk hunting groups provide an important social network and can in some cases be among the last remaining organised activities in remote villages.

The use of conservation and other recreation areas is increasing. Statistics collected by Metsähallitus Natural Heritage Services (NHS) show an increase in visits to national parks (Fig. 6). Besides the positive health impacts of visits to national parks and the invaluable spiritual experiences collected therein, national parks also bring considerable economic benefits to the surrounding area. Studies conducted by Metsähallitus NHS and Finnish Forest Research Institute reveal that, on average, one euro spent on the recreation infrastructure in a national park returns to the local economy tenfold in the form of increased demand for accommodation and outdoor activity services, for example. The total local economic and employment impacts of the visitors' spending for the 37 national parks of Finland were 110 million euros and 1 412 person years in 2012.^{xii}

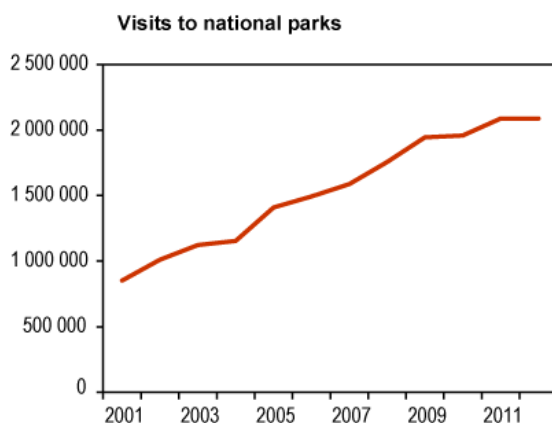


Figure 6. Total number of visits to the 37 national parks of Finland.^{xiii} Source: Metsähallitus Natural Heritage Services.

Results from the Pallas–Yllästunturi National Park in Lapland suggest that investments in infrastructure and tourism facilities of conservation areas near tourism centres can be most productive if the target area is correctly selected. While only a limited number of areas can become remarkably successful, tourism can be of great importance locally.^{xiv} A study of the economic impacts and significance of natural resources based industries in the municipality of Inari, Lapland, showed that tourism has become the most important of such industries and currently provides more jobs than forestry.^{xv}

A part of state owned commercial forests are in intensive recreational use. Some of these areas have been given a special recreational status within the nature resource planning processes applied by Metsähallitus, the administrator of the state-owned land and water areas. According to a study by Finnish Forest Research Institute, management actions that facilitate and promote recreation in such areas may yield benefits at least twice the costs of decreased forestry income. In other words, in areas with heavy recreational use, it can be economically justified to adjust loggings to recreational requirements rather than manage forests in business as usual manner.^{xvi}

In summary, many studies have emerged during the past years that underline growing economic importance of nature based tourism and the need to adjust other economic activities to its needs. The possibilities to create new markets for these services have also been studied (see below).

Besides values related to recreation and tourism, a number of other cultural ecosystem services are also important to Finland. However, there has been much less research focusing on these. Natural habitats and species play an indispensable role in Finnish culture in all its forms. Ranging from the iconic works of the golden era of Finnish national romantic painting, music, architecture and design in 1880–1910 to modern visual arts and from art music to popular music, for example, nature acts both as a central theme and an essential backdrop of the human experience. Despite urbanisation and modernisation the close ties of the Finnish culture to biodiversity are still visible in many ways.

Cultural ecosystem services lie at the heart of Saami culture and identity. Because of the nomadic lifestyle and use of decomposable materials such as wood, little of the cultural heritage of the Saami people exist as enduring built structures. Instead, the Saami culture relates strongly to the natural landscape. This is manifested, for example, in the rich terminology and knowledge that relates to nature. Despite the wide dispersal of the Saami people – 60% of the 10 000 Saami living in Finland now live outside their Homeland – cultural ties to the landscapes of northern Lapland remain strong also among those living elsewhere. From the point of view of the continuation and development of Saami culture practices and traditions related to species, habitats and landscapes remain a key question.

1.1.4 Water for life

As an abundant resource and landscape element – the Baltic Sea covers 19% and inland waters 8% of the total area of Finland – water acts as an important bridging ecosystem service in Finland. Water habitats produce a number of essential provisioning services such fish, game and clean water. Furthermore, water is very important culturally. Many popular recreational activities such as swimming, boating, and fishing depend on water. Most of the 500 000 summer cottages owned by Finnish families are situated along watercourses or by the sea. Representations of lake and sea landscapes are an indispensable part of Finnish visual and literary culture.

From a systemic point of view water quality is largely the product of processes in the catchment area such as the leaching or retention of nutrients and organic matter. The ecological state of surface waters (Fig. 14) is thus heavily influenced by the functioning of regulating services in terrestrial environments. Many ecosystem processes need to be functioning well in order for the water quality and ecological state of a water body to be

good. Also historic processes still play a role as old sediments affected by nutrient run-offs in past decades might weaken the water quality at present. This must be taken into account when new targets are set for nutrient discharges. It can be argued that clean water is one of the most important ecosystem services in Finland as, at the same time, the demand for it is great and its production crosscuts a wide range of processes in the catchment area.

1.1.5 Markets for ecosystem services

For the time being, few established and well-functioning markets for other ecosystems services than provisioning services exist in Finland. Markets for regulation and maintenance services are mainly non-existent and many cultural ecosystem services also lack an established trading mechanism. However, research and development work is being carried out to overcome this shortcoming.

The joint production and market creation for different ecosystems services provided by forest ecosystems has been studied in a project led by Pellervo Economic Research^{xvii}. One of the burgeoning examples of ecosystem service markets is the forest certification scheme in which the safeguarding of biodiversity is thought to increase the price of timber when produced according to certification criteria. In Finland forests are certified under market-based certification schemes PEFC and FSC. Certification of forests is voluntary. However, not being involved in a forest certification scheme may be a disadvantage to a forest owner since that may hinder to sell timber.

The Forest Biodiversity Programme METSO has brought market-based approaches into conservation. Compensations for the voluntary safeguarding of certain biodiversity values have been paid through a market mechanism and forest-owners have been given several options for maintaining biodiversity on their land (see also Part II and Part III).

The Finnish Forest Research Institute has studied the possibilities of launching payments for forest ecosystem services scheme in Kuusamo, north-eastern Finland^{xviii}. A large share of forest land in Kuusamo is privately owned and has been intensively managed for timber production. At the same time, the area is one of the most important and fastest developing centres for nature-based tourism in the whole country. Revenue collected from tourists as payments for recreational qualities could be used to compensate landowners' reduced income from forestry, for example.

According to the study, tourists would be willing to pay for increased biodiversity and reduced clear-felling in forests. Most of the 900 tourists who took part in the study stated that they felt landscape quality and biodiversity were important, and that they would be willing to pay their share for preserving these qualities. Ninety per cent of participants agreed or strongly agreed that 'biodiversity should be preserved' and more than half (58%) felt that 'tourists should pay their share for preserving the landscape'. When asked how payments should be collected most participants favoured adding the charges to the price of accommodation. Interestingly, half (51%) said that the payments should be compulsory rather than voluntary. These results suggest that a scheme to charge tourists for the benefits of forest ecosystem services could be successful in this area. The preliminary results from landowner study also suggest that a relatively large share of forest owners is willing to give their land for the use of commercial recreation if reasonable compensation is received. Obstacles include establishing an organisation to collect and distribute compensation payments.

More studies are still needed for valuing and marketing of ecosystem services provided by forests e.g. how different services are produced and can be combined as well as how the trading mechanisms would function. For example, commercially managed forests provide a number of different ecosystem services concurrently such as wood, water retention and recreation.

At present, nine percent of the total area of cultivated land is under organic farming and organic products have a 1.6% share of the total foodstuffs market (Fig. 7). Organic production is one of the most important ways to differentiate markets by providing the consumer with a choice by which he can pay for increased attention to environmental and biodiversity issues. Since organic farming relies to lesser extent on extra-farm inputs (e.g. no fertilizers or pesticides used) it can be argued that it utilises ecosystem services more effectively than conventional farming.

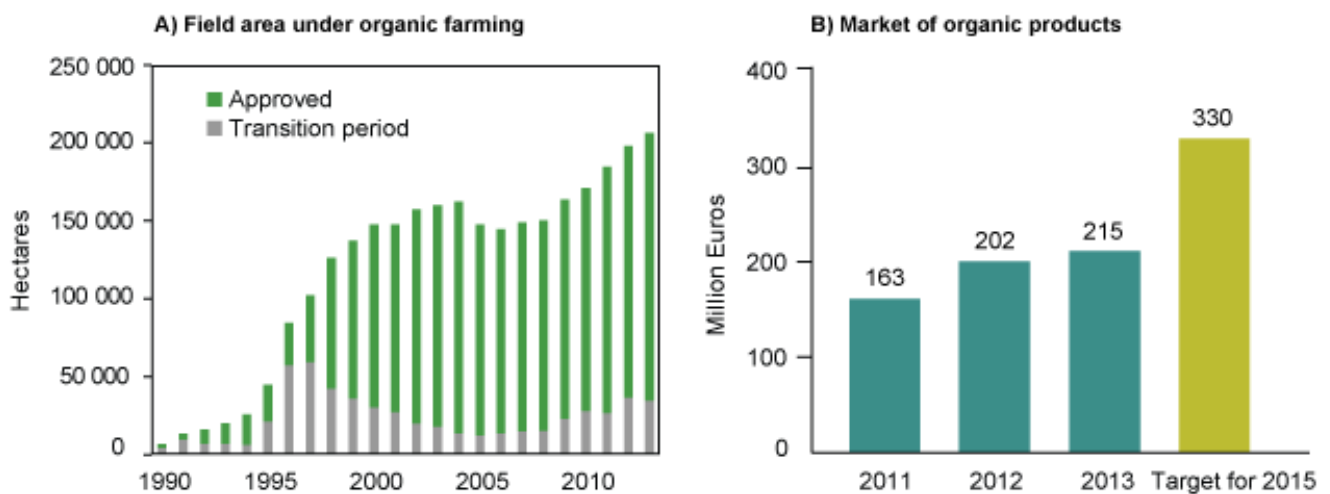


Figure 7. Field area under organic farming 1990–2012 (A)^{xx} and development of the market for organic products 2011–2013 and a target set for 2015 by Pro Luomu (B)^{xx}. Sources: Finnish Food Safety Authority Evira and Pro Luomu.

1.1.6 Biodiversity and health

Scientific evidence on the beneficial impacts of biodiversity on human health is beginning to mount. The topic is especially important in an industrialised country like Finland where, on the one hand, urbanisation has been rapid and now more than 80% of citizens live in cities, but, on the other hand, there is still much potential for engaging with biodiversity in terms of abundant natural areas. Green spaces can reduce crime, foster psychological wellbeing, reduce stress, boost immunity, enhance productivity and promote healing. Multiple benefits can also arise from brief encounters with nature or experiencing nature on a smaller scale such as in urban parks and nearby forest areas

The interrelationship between environmental biodiversity, human microbiota and allergies has been studied by a group led by researchers from the University of Helsinki^{xxi}. The study found an interesting connection between declining biodiversity and increasing occurrence of atopic diseases in urban areas. Biodiversity, as measured by number of vascular plant species and heterogeneity of land cover around the study subjects' homes, influenced the composition of bacteria classes on study subjects' skin. Individuals having atopic symptoms had less biodiversity surrounding their homes. A negative correlation was found between uncommon native flowering plants and occurrence of atopy indicating that higher variety of plant species in one's surrounding may work against developing allergy.

A study by Finnish Forest Research Institute on the health impacts of the green environment field experiment was carried out in two urban parks and in the city centre of Helsinki. The psychological measures of stress relief show that the large urban park and extensively managed urban woodland had almost the same positive influence, but the overall perceived restorative effects were higher in the woodland after the experiment.^{xxii} A programme similar to the Healthy Parks Healthy People initiative of Parks Victoria, Australia, has been introduced in Finland by Metsähallitus NHS.^{xxiii} The aims of this programme include improving public health by encouraging people to

get out into natural settings, enjoy positive and genuine experiences, and improve their physical health through a wide range of outdoor activities.

Finnish Environment Institute and Finnish Forest Research Institute have started a project in 2013 to examine the connections between ecosystem services and human health. The objects of the project are to define the ecosystem services that influence both physical and mental aspects of health and to understand more profoundly the links between them. Furthermore, the results are expected to be of help for example in land use planning as the health benefits springing from ecosystem services can be taken into account.^{xxiv}

Most Finns, regardless of social status or place of residence, have relatively easy access to nature. On top of low population density, this is a result of inclusive everymans' rights, family roots in the countryside and ease of travel, to name a few. Limitations to access to nature may arise from low economic status in connection with urban residence as well as from old age or physical disabilities. These limitations pose challenges for city planning and social services, for example, and need to be addressed to ensure that all citizens have an opportunity to benefit from personal contact with biodiversity.

1.1.7 Stability in the face of climate change

Mainly because of the country's northern location and abundance of surface water, Finnish forestry and agriculture are expected to benefit from climate change. Crop harvests and the volume growth of trees are expected to increase, for example, as the growing season becomes longer and effective temperature sums continue to grow. At the same time, climate change also poses serious threats to primary production. Warmer winters, increasing precipitation (in Finland 20% increase by 2100) and soil wetness and run-offs (10% increase) accelerate nutrient leaching to water bodies and weaken the nutrient balance of soils, for example on arable land and forests. The problem is gravest on clay soils in south-western Finland where 90% of phosphorus and nitrogen leaches during run-offs after growing season. In order to avoid this, the infiltration capacity of farmlands should be ensured. Maintenance of natural wetlands with low water abundance but sufficient water release to river basins is equally important for biodiversity and for controlling the nutrient leakage.

Pest outbreaks present another increasing threat for forestry and agriculture. One example of recent threats is the increased occurrence of the European spruce bark beetle (*Ips typographus*) in commercial forests. The most important reasons for these outbreaks are the increased occurrences of long, hot and dry periods in summer. Also the lengthening of frost-free periods make the forests more susceptible to autumn storm damages which may increase the beetle populations given that the breeding conditions next summer are favourable for the species. A further threat, which is likely to become more potent due to climate change are invasive alien species for which the warming climate opens new pathways for invasion.

An ecologically informed response to the various threats posed by changing climate would be to ensure the healthy functioning and resilience of ecosystems. In commercial forests and on agricultural land this means, among other things, ensuring high species diversity. In the case of a sudden disruption such as a pest outbreak the ecosystem would stand a better chance of recovery as the more diverse species pool would include both biological pesticides and species able to benefit from the new circumstances. In a changing climate a biological insurance against large scale disruptions could be increasing the volume of dead wood in forests and the area of buffer strips and other set aside areas with natural vegetation in agricultural landscapes. There has been an aim to increase the amount of dead wood in the forests nationwide for its benefits for forest biodiversity. On the other hand, lately felled spruce causes an increasing risk of pest outbreaks and thus risks for forestry. As climate change advances, Finland's role in providing a haven for European species, supplying agricultural and forestry products and acting as a source of fresh water can be expected to grow.

1.1.8 Intrinsic value

Finns have a long and rigid tradition in studying biodiversity both in the form of professional academic research as well as amateur interest in species, habitats and their preservation. One example of this is the latest Red List of Finnish species 2010 which is among, if not the, most comprehensive red list in the world. Approximately 48% of the total number of 45 000 species reported from the country were evaluated according to international criteria set by the IUCN. The evaluation was carried out by expert groups involving a high share voluntary work. Academic research in Finland in the realms of ecology and evolutionary biology has been assessed as being of particularly high standard in international comparison^{xxv}.

Although biodiversity can, of course, be approached with a multitude of agendas, the high numbers of people interested in nature indicates a deeper appreciation for biodiversity than mere benefit driven preoccupation. Relative to population size, the number of members in environmental organisations is quite high. The membership of two leading non-governmental organisation (NGOs), Finnish Association for Nature Conservation & Finnish Nature League and BirdLife Finland, and the leading outdoor association Suomen Latu has been expanding during the past decades (Fig. 8). Yet a much higher number of people take part in practical conservation work or donate money to conservation purposes. Interestingly, more than 20% of Finns report watching birds in some fashion, for example. The same holds true for nature photography.^{xxvi}

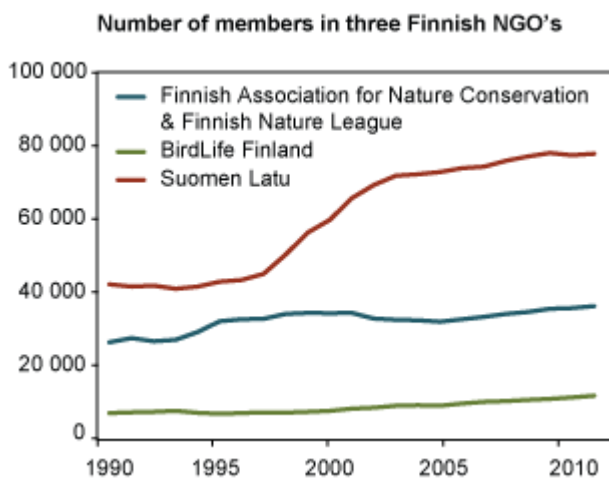


Figure 8. Number of members in two Finland's leading environmental organisations, Finnish Association for Nature Conservation & Finnish Nature League^{xxvii} and BirdLife Finland^{xxviii}, and the leading outdoor association Suomen Latu^{xxix}. Sources: Finnish Association for Nature Conservation, BirdLife Finland and Suomen Latu.

Another demonstration of the compassion that Finnish people feel for nature is the Finnish Natural Heritage Foundation, an NGO which was founded in 1995 to promote the protection of old growth forests. The foundation receives donations primarily from private citizens and uses these to purchase land for conservation. By 2013 the foundation has used nearly four million euros for land acquisition and has been able to protect 830 hectares of high nature value forest and mire across the country, with accent on southern Finland where percentage of protected forests is lowest (Fig. 9).

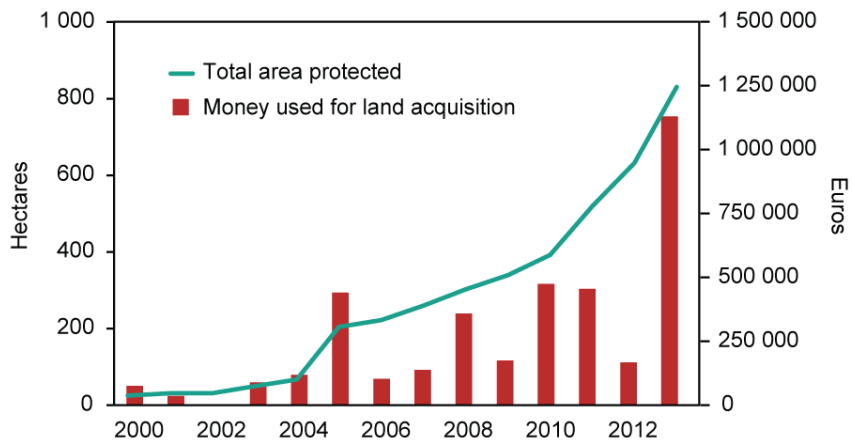


Figure 9. Total area protected (ha) and money used for land acquisition (€) by the Finnish Natural Heritage Foundation^{xxx}. Source: Finnish Natural Heritage Foundation.

STATUS AND TRENDS OF BIODIVERSITY

Q2: What major changes have taken place in the status and trends of biodiversity in your country?

A broad picture of the status and trends of biodiversity in Finland can be obtained through the approximately 120 indicators included in the national biodiversity indicator collection available at www.biodiversity.fi. Instead of a comprehensive account of all known trends, a representative collection of recent trends and interesting new data are presented in this section. Reader should refer to the full indicator collection for further data and a more in depth analysis. In this section the account of biodiversity trends has been organised according to the primary habitat type present in Finland as well as one cross-cutting theme: climate change.

1.2.1 Forests

Forests on mineral soils cover 46% of the land surface and 36% of the total surface of Finland. They host some 42% of all well-known species and 36% of all threatened species. Approximately 9% of the assessed forest species are threatened. Many of the forest habitat types have been evaluated as threatened. Forested land (including forested peatlands) covering about 75% of total area of Finland is divided between 52% private, 35% state and 13% company and community ownership.

Finnish forests are composed of relatively few tree species. Over 20 tree species occur in Finland but 97% of the total volume is composed of pine, spruce and birch and, in many cases, forest stands are dominated by only one species. The volume and relative abundance of tree species is significant for biodiversity. Tree species vary in their structural characteristics and host different species. For example, herbivores are often able to feed only on a few species or plant parts. Different tree species also provide habitats for different epiphytic lichen species and are eventually decomposed by specialized organisms.

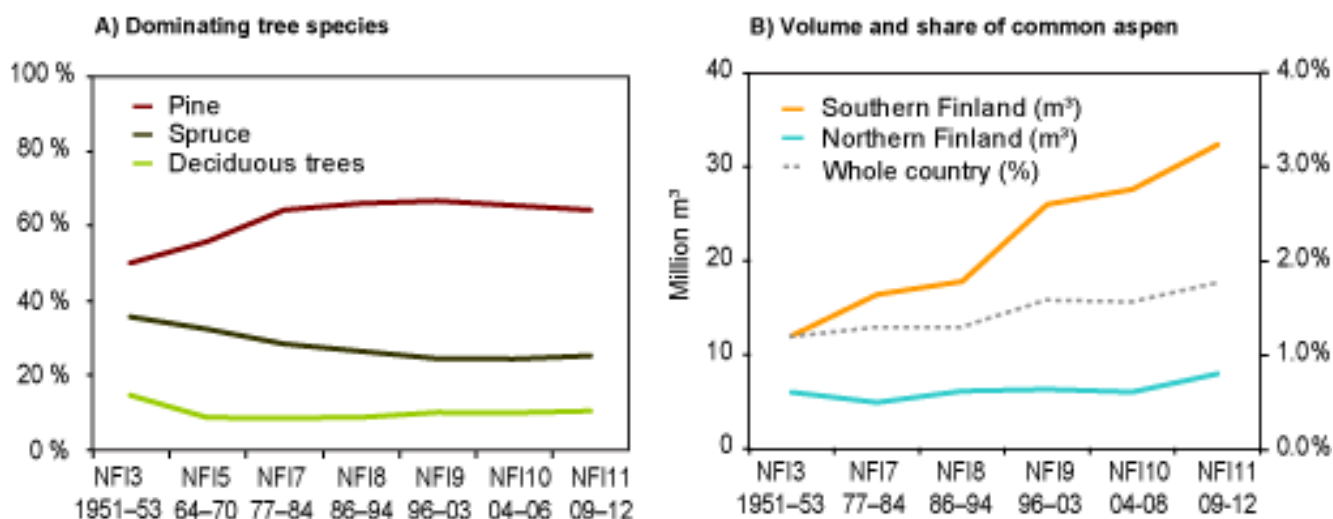


Figure 10. Finnish forests by dominating tree species 1951–2012 (A) and volume and share of common aspen of the total growing stock 1951–2012 (B) according to National Forest Inventory (NFI). These figures include also some peatland forests (spruce and pine mires^{xxx1}). Source: Finnish Forest Research Institute.

Commercial forest management has changed the tree species composition of forest habitats since 1950s (Fig. 10). The preference of Scots pine (*Pinus sylvestris*) over other species in artificial regeneration and the draining of mires have increased the share of pine-dominated forests by 17% during the past 60 years. At the same time, the share of spruce-dominated forests has fallen by 11%. Deciduous forests continued to decline until the 1960s as a result of the cessation of slash-and-burn cultivation and the following succession of forest stand towards conifer dominated stages. The forests are regenerated using domestic tree species and the share of non-domestic tree species is very small, less than 0.1%.

Over the past four decades forest stands dominated by deciduous trees have become more common again. Also the volume of deciduous trees in the conifer-dominated forests has been increasing. Recent trends include also the rather rapid growth in the volume of common aspen (*Populus tremula*), which has more than doubled in southern Finland since the 1950s. Common aspen is a key species for many species. The leaving of large and old aspens as retention trees in regeneration fellings has helped some endangered beetle species that specialise in them.

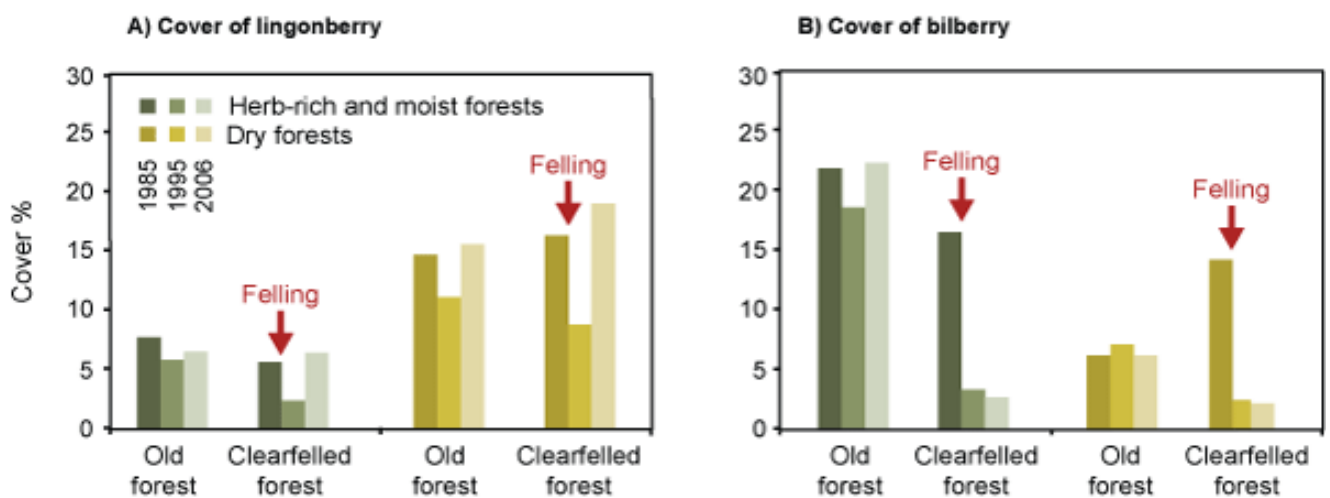


Figure 11. Coverage of two forest understorey key species, Lingonberry (*Vaccinium vitis-idaea*) and Bilberry (*V. myrtillus*) in old unfelled and regeneration felled forests 1985–2006.^{xxxii} Source: Finnish Forest Research Institute.

Regeneration fellings (clearfellings and seed and shelter tree fellings) in commercial forests affect understorey vegetation to a great degree (Fig. 11). After fellings the cover of dwarf shrubs, bryophytes and lichens decreases strongly.^{xxxiii} For example, the cover of bilberry (*Vaccinium myrtillus*) often falls by more than 80% and the recovery is very slow. The overall cover of bilberry has decreased in Finland from 18% to 8% in forty years. This is mainly due to forest management actions made since the 1950s. The bilberry does not grow well in young forests and it is most abundant in forests aged over 100 years.^{xxxiv} Bilberry is a key species in the forest ecosystem as its berries and shoots are eaten by many species including forest grouses. Bilberries are also commonly picked by humans making it an economically important species in that respect as well. Some other species such as lingonberry – another economically important key species – seem to recover quite rapidly after fellings.

There have been some changes in understorey vegetation in old unfelled forests as well. The cover of lichens has fallen by 60–80% and the cover of bryophytes has increased especially in drier forests. The probable causes for these changes are natural succession, but also nitrogen deposition and reindeer herding in northern Finland may play a role.

1.2.2 Mires

Mires are the second most extensive habitat type in Finland covering 28% of the land surface and 20% of the total area of the country. Mires are rather species poor environments being the primary habitat of only 4% of all well-known species and 5% of all threatened species. However, the variety of mire vegetation types is extensive. Due to draining and other transformative uses 57% of mire habitat types have been evaluated as threatened. In southern Finland this figure is even higher, 77%.

Altogether 5.7 million hectares of Finland's mires have been drained as a result of forest management operations mainly, but also as a result of agriculture and peat production. This equals 55% of the original mire area. The draining of pristine mires was largely given up by the end of the 1990s and emphasis has been since put on ditch cleaning and associated supplementary draining. Some 19 000 hectares of drained mires have been restored 1989–2012 in protected areas. Despite such efforts, the balance of undrained mires has continued to be negative during past years since more mires are still being converted into arable land and taken up as peat production areas.

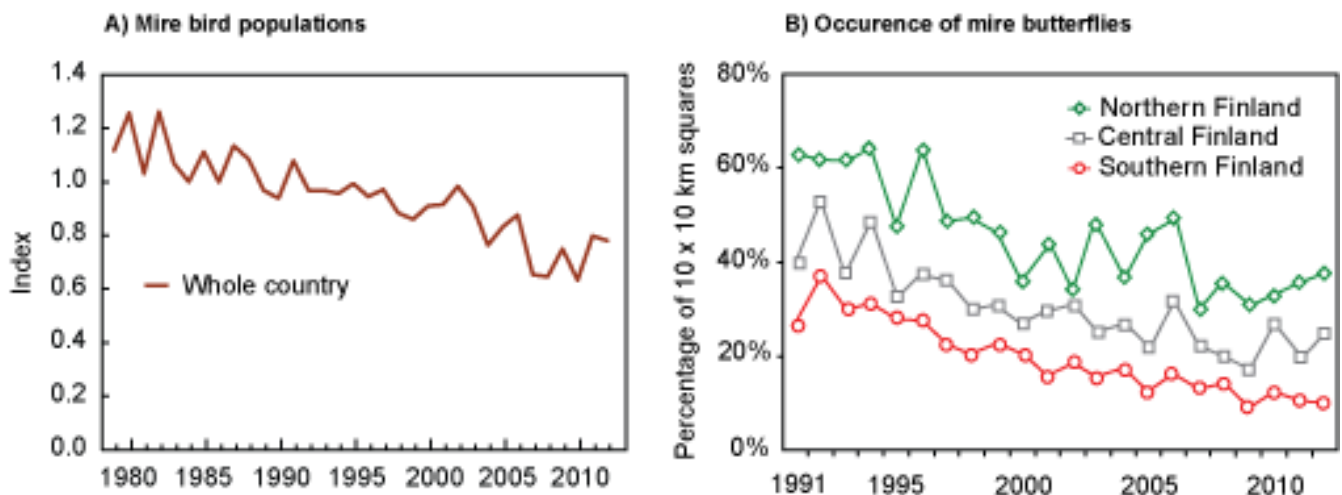


Figure 12. Mire bird population index (11 species) 1979–2012 (A)^{xxxv} and occurrence of mire butterflies (8 species) 1991–2012 (B)^{xxxvi}. Sources: Finnish Museum of Natural History and South Karelia Allergy Institute.

The populations of both mire birds and butterflies continue to fall. In both cases the most probable reason is the historical decline of suitable habitats. Although the rate of loss of undrained mires has slowed down during the past 20 years many species may still be declining because of human actions in the past: vegetation changes after draining continue and especially butterfly individuals experience difficulties in finding suitable habitats patches in the fragmented landscape.

The populations of mire birds have declined by almost 40% during the past three decades. Many of these species have disappeared from southern and central parts of the country where draining has been most prominent, and are now classified as nationally or regionally threatened. Since all of the 11 mire birds included in the index are migratory species changes in their over-wintering areas may affect their populations to some extent. On the contrary, all eight Finnish mire specialist butterfly species are sedentary. Half of them have been observed to decline rapidly after the draining of pristine mires and their overall occurrence has decreased in all parts of the country.

1.2.3 Baltic Sea

Finnish territorial waters and the country's exclusive economic zone (EEZ) take up slightly less than one fifth (82 000 km²) out of the total 422 000 km² surface area of the Baltic Sea. The share of the Baltic Sea of Finland's total land and water area is 19%. Because of low salinity relatively small amount of actual marine species occur in the Finnish territorial waters. Only 1% of well-known species of Finland live primarily in the Baltic Sea.

Indicating general deterioration of water quality, the concentration of chlorophyll-*a* in surface water has increased during the past three decades in the Finnish coastal areas (Fig. 13 A). In the Gulf of Finland chlorophyll-*a* concentration more than doubled between 1980 and 2000. Since the turn of the millennium, there seems to be a declining trend in the Gulf of Finland while the situation is still worsening in the Archipelago Sea.

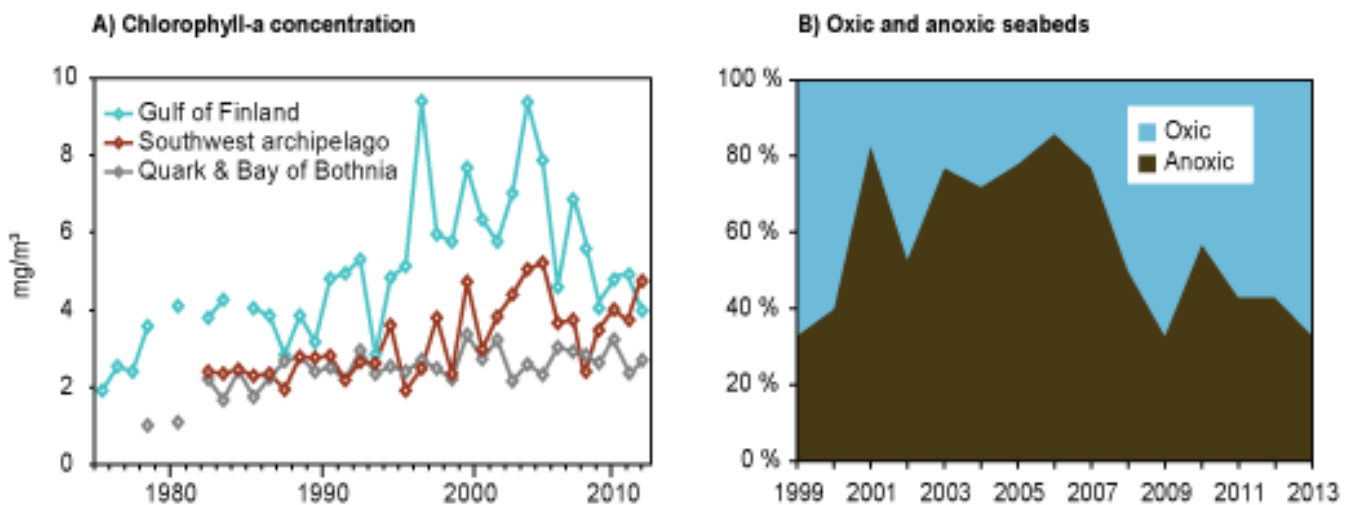


Figure 13. Chlorophyll-*a* concentration in Finnish coastal waters 1975–2012 (A)^{xxxvii} and the percentage of oxic versus anoxic (dead) seabeds in the Gulf of Finland 1999–2013 (B).^{xxxviii} Source: Finnish Environment Institute.

Chlorophyll-*a* concentration illustrates the abundance of microalgae in the water. As this primary production increases, the amount of light reaching the bottom decreases. As a result, several microhabitats may be lost and species diversity reduced. Increasing biomass might also cause oxygen depletion in the seabed, as decomposing consumes all the oxygen in the water. If oxygen concentration drops below zero toxic hydrogen sulfide is released and all macrofauna is killed.

The proportion of anoxic seabed areas in the Gulf of Finland has been high throughout the 2000s (Fig. 13 B). In an average year more than 50% of the monitored seabed areas have suffered from the absence of oxygen. Some species recover from oxygen depletion or anoxia more efficiently than others. This results in dominance of these species in areas of periodic oxygen depletion, which in turn leads to changes in the benthic community composition and affects the whole ecosystem. Since 2009 the situation has been slightly better although it is too early to say if this represents a lasting trend.

The changes in water quality and rate of primary production have many kinds of impacts on species. A large number of species decline as the turbidity of water increases and photosynthesis becomes impossible in deeper layers. Many ecologically important communities such as eelgrass meadows and bladderwrack communities decline. On the other hand, many fish species benefit, at least up to certain point, from increased production. Along with them increase the numbers of species that eat fish. For example, the populations of most bird species living in the archipelago have never been this strong since the beginning on monitoring in the 1930's. Along with abundance of food, their populations have also been impacted by the decline of hunting and persecution.

1.2.4 Inland waters

The surface area of Finland's inland waters is large, 34 000 km², making inland waters the fourth largest primary habitat type in the country (8% of total area). There are 56 000 lakes larger than one hectare. Of all well-known species 6% occur primarily in inland waters, which is also the share of inland water species of all threatened species.

The ecological state of surface waters was evaluated in 2013 as excellent or good in 85% of the area of lakes and 65% of the length of rivers included in the monitoring scheme (Fig. 14 A). There have been no significant changes in water quality or microalgae production caused by nutrient loading in the lakes in excellent or good condition. The state of 13% of lake area was classified as moderate and 1% as poor or bad. Lakes in these categories are located next to extensive farmlands or below industrial or urban areas. The percentage of small lakes in the lower categories is much higher than that of big lakes. Lakes in the most intensively farmed areas in southern and western Finland are mainly small to medium sized lakes. These have often been impacted by nutrient run-offs from agricultural land especially in south-western Finland where arable lands are mainly erosion sensitive clay soils. Additionally, the old sediments rich in nutrients from past decades still affect water quality at present.

Most of the rivers evaluated as in excellent or good ecological state flow in the northern Finland. In these rivers migrant fish species can reproduce naturally and also sensitive fish and benthos species occur. Most rivers evaluated satisfactory, poor or bad are located in the western and south-western Finland. These rivers are affected by eutrophication caused mainly by agriculture. The discharge of rivers with weaker quality is also often being regulated both because of hydropower production and flood protection

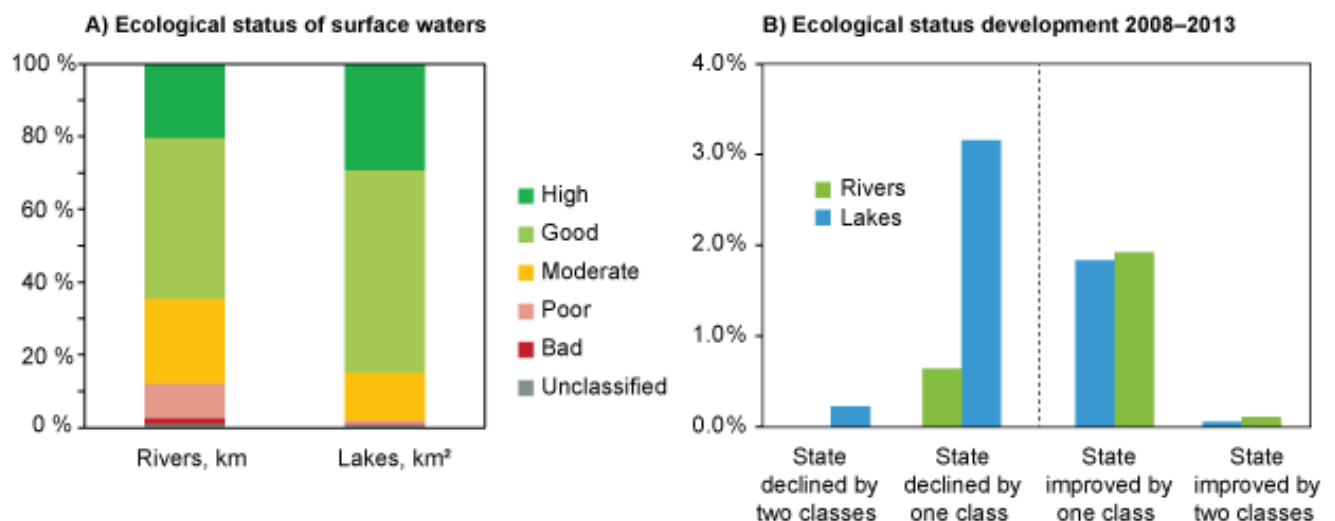


Figure 14. Ecological status of surface waters in Finland in 2013 (A) and development between 2008 and 2013 (B).^{xxxix} Source: Finnish Environment Institute.

Between the two assessments made in 2008 and 2013 there have been small changes in the ecological status of lakes and rivers (Fig. 14 B). A higher proportion of lakes were classified as declining rather than improving in quality. On the contrary, most changes in river quality were positive. Changes in the factors that affect inland water quality are slow. Ditch cleanings in peatland forests and increased winter time runoffs from agricultural fields due to shortened period of snow cover increase the loading of nutrients and organic matter. However, the management of sewage from the scattered dwellings is becoming more efficient and many water protection measures have been applied in forestry and agriculture, such as buffer zones and lighter soil preparation methods.

1.2.5 Farmlands

Finland's farmlands are situated mainly in the southern and western parts of the country. In total, farmlands cover 7% of the total and 9% of land area. Relative to their scarcity, farmlands are particularly species rich habitats: 16% of all well-known species and 18% all threatened species live in agricultural lands. Traditional rural biotopes such as dry meadows and wooded pastures are the most species rich and, at the same time, most threatened types of farmland habitats.

Historically the biggest changes affecting farmland biodiversity have been the dwindling of many traditional agricultural practices related to low-intensive animal husbandry. Modern agriculture relies, instead, on intensive land use as well as the application of ex-farm substances such as mineral fertilizers, herbicides and pesticides, although in animal farms the manure is the main nutrient source. The development of the area of high nature value farmland has been monitored since 2007 (Fig. 15 A). The short time series shows a moderately declining trend. The new agri-environmental programme (in CAP II pillar) aims to enhance farmland biodiversity (2015–2022) and may change the trend. Finnish high nature value (HNV) farmlands are most abundant in Northern Ostrobothnia and some eastern parts of the country as well as on the Åland Islands. For example dairy farms and the abundance of other grazing animals are characteristic in these areas. In conjunction there are more natural pastures and the landscape is more varied on the whole. The lowest proportion of HNV farmland is found in southwest Finland where there is intensive cereal production and little heterogeneity in the cultivated landscape. However, buffer zones and fields adapted for richer biodiversity have improved the situation in recent years.

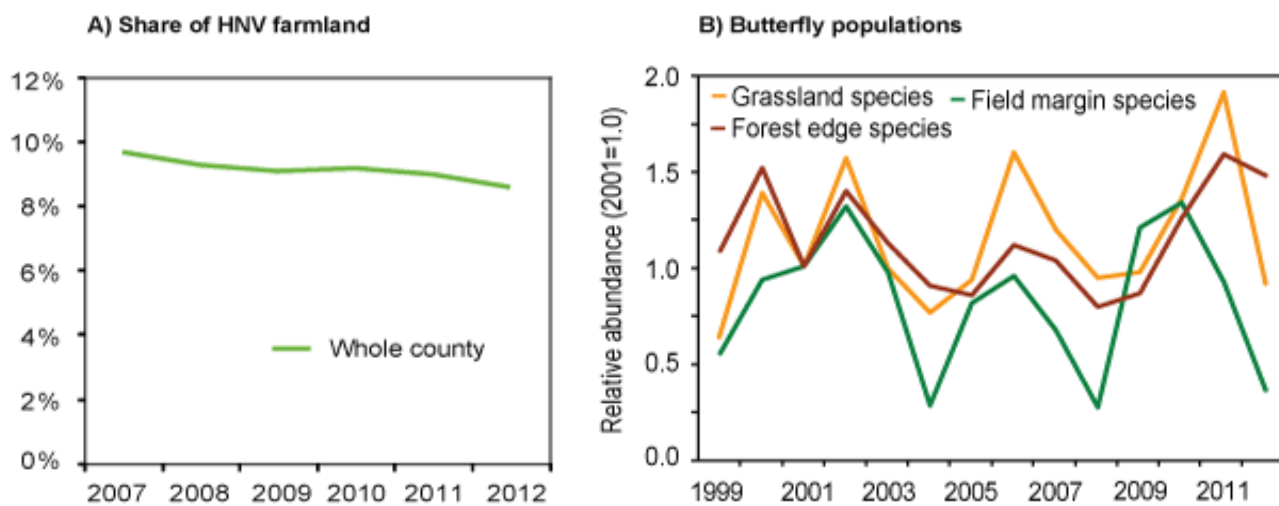


Figure 15. Share of high nature (HNV) farmland of all agricultural land 2007–2012 (A)^{xi} and trends of farmland butterflies by ecological group 1999–2012 (B)^{xii}. Sources: Tike (Information Centre of the Ministry of Agriculture and Forestry) and Finnish Environment Institute.

Changes in agriculture are reflected in many aspects of farmland biodiversity. For example, farmland birds have declined by 50% from 1979 until present with no sign of reversing of the trend in recent years. Many farmland butterflies have also declined historically, especially grassland species preferring traditional rural biotopes. However, recent trends of butterfly populations have been quite stable (Fig. 15 B). Since the beginning of purpose-built monitoring in 1999 grassland species may even have increased slightly. Field margin and forest edge species show no trend. The annual life cycle of butterflies is affected to a great extent by prevailing weather conditions. This is reflected in the strong annual fluctuation of the butterfly indicator. On the whole, past summers have been warm. This has been beneficial for many farmland butterflies.

1.2.6 Alpine habitats and climate change

Finland's alpine habitats comprise some 15 000 km² of the very northernmost parts of the country (4% of total area). These are either treeless mountain tops or semi open mountain birch forests lying normally higher than at 300 metres above sea level. Of all well-known species 3% live primarily in alpine habitats.

Data on the development of alpine habitats and species are rather scarce. Only two monitoring schemes cover the area to some degree. The condition of lichen grounds – elementary for reindeer overwinter survival – has been deteriorating for over the past two decennia. The sizes of reindeer herds have remained at such a high level that the depleted lichen grounds do not recover. The high grazing pressure by reindeer has also other negative impacts on the alpine flora and fauna including the hindrance of the regrowth of mountain birch forest after autumnal moth (*Epirrita autumnata*) outbreaks. Besides negative effects, reindeer grazing has also some positive impacts on vegetation on more nutrient-rich sites.

The indicator on alpine breeding birds covers a 17 year period starting from 1996 and includes the combined population trends of seven species living in open mountain heaths and mires as well as in mountain birch forests (Fig 16 A). The indicator shows a worryingly declining trend: a drop by one third in less than two decades. The reasons behind this remain unclear. Although none of the species are sedentary their migration strategies vary from nomadism and short distance migration to overwintering in sub-Saharan Africa.

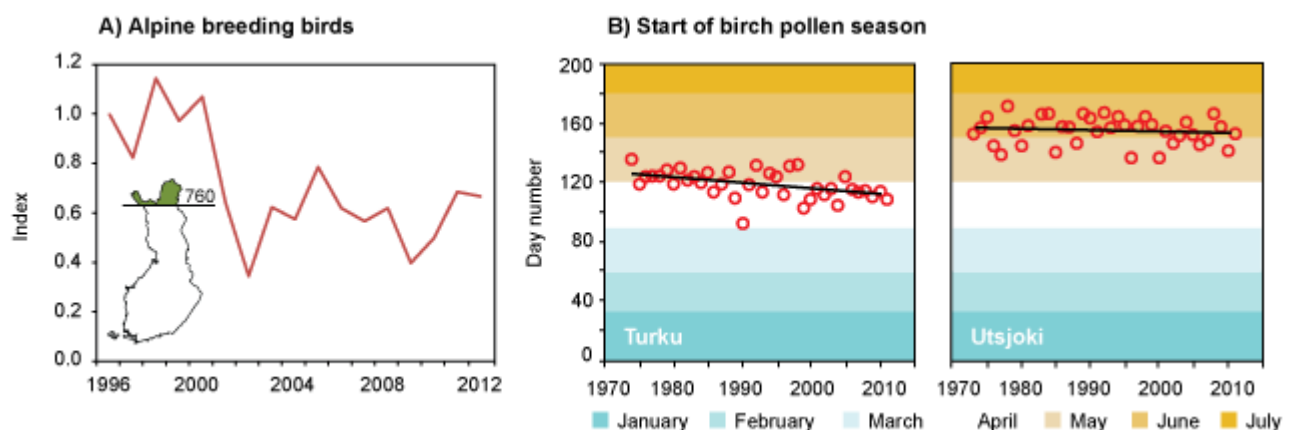


Figure 16. The combined population index of seven alpine breeding birds species 1996–2012 (A)^{xlii} starting day of birch pollen season in Turku (southwest Finland) and Utsjoki (northern Lapland) 1970–2011 (B)^{xliii}. Sources: Finnish Museum of Natural History and University of Turku.

One overarching factor affecting alpine biodiversity is climate change. Its impacts are predicted to be most pronounced in northern parts of the country yet direct evidence of climate change actually driving the decline of alpine populations or habitats is thus far rare. Furthermore, some climatic trends seem to contradict expectations. In Turku, south-western Finland, birch pollen season started in the beginning of 2010s two weeks earlier than in the 1970s, but in Utsjoki, at the very northernmost end of the country, only a day or two earlier (Fig 16 B). Growing season has lengthened in Finland by five to ten days since 1960. This change has also been greater in southern parts of the country although the geographical differences are smaller than in the case birch pollen season.

1.2.7 Threatened species

Altogether 2 247 species were evaluated as threatened in the latest species red-list assessment of 2010 (categories critically endangered, endangered and vulnerable). This equals 10.5% of all the 21 398 species included in the assessment. The share of evaluated species of the total estimated number of species recorded from Finland (approximately 45 000) is quite high, 47%.

From the point of view of reaching the Aichi targets as well as targets set in the EU and nationally the most interesting data come from comparing the two latest assessments of 2000 and 2010. The assessments were conducted principally in similar fashion and according relatively unchanged criteria. To further ensure comparability, genuine changes of red-list categories were separated from those arising, for example, from changes in criteria or increased knowledge.

While looking at genuine red-list class changes between 2000 and 2010 according to species' primary habitat, the development in some habitat types appears particularly worrying (Fig. 17). More than 80% of the class changes in mires, alpine habitats, shores and rocky habitats were negative. There appears to be little positive development in these habitats. The only habitat type where most of the changes were positive is urban areas. In the habitat types with the highest overall number of threatened species, forests (36% of all threatened species) and farmlands (18%), the ratio between positive and negative development was more even but, nevertheless, still dictated by changes in the negative direction.

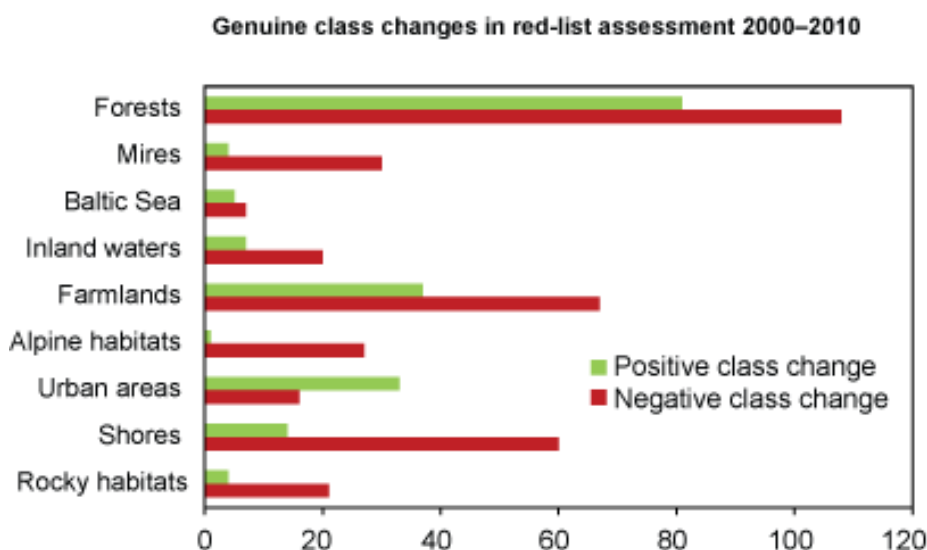


Figure 17. The number of genuine class changes between the red-list assessment of 2000 and 2010.^{xliv}
 Source: Ministry of the Environment and Finnish Environment Institute.

A red-list index (RLI) for Finnish species was published in 2013 (Fig. 18). This index has been calculated by using the same methodology as in global RLIs and is based on the same genuine red-list class changes than Fig. 17 above. The overall development of the RLI was slightly negative, from 0.883 in 2000 to 0.880 in 2010 (all species). This means that the rate at which species were heading toward regional extinction in Finland increased slightly. There was positive development in four species groups: dragonflies and damselflies, bugs, beetles and polypores. The three insect groups included in the analysis had also a higher RLI any other group indicating a lower extinction risk overall. At the other end, mammals had the lowest RLI value, which means that they have the highest regional extinction risk. Their status also worsened between 2000 and 2010. The RLI for birds declined most steeply, by 2.2% from 0.873 to 0.854.

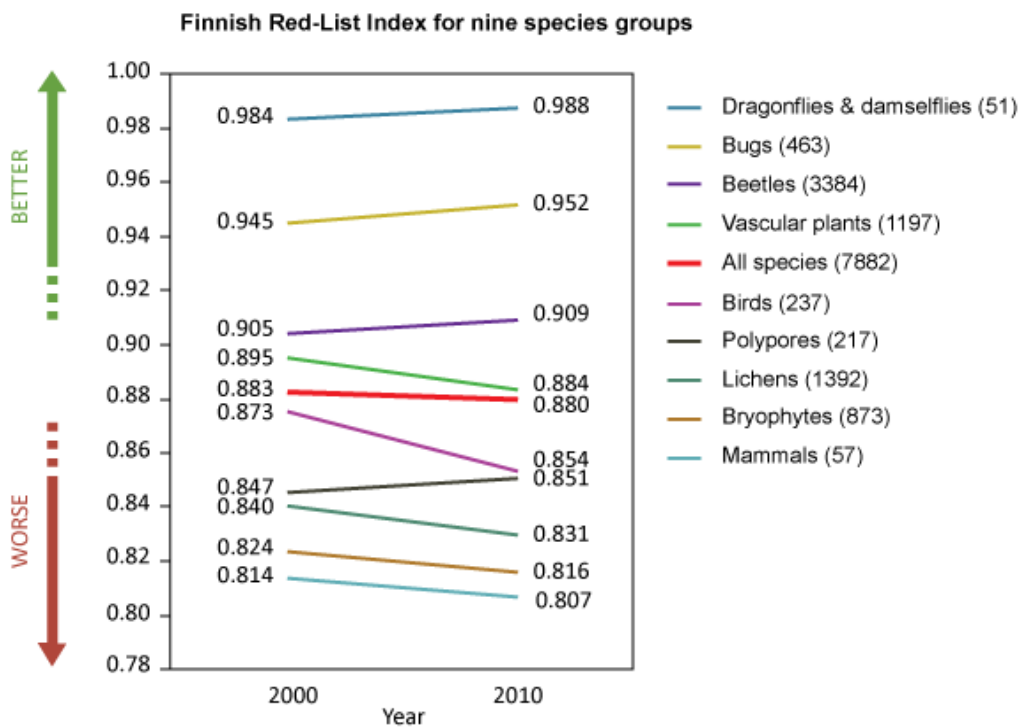


Figure 18. Development of Finnish Red-List Index for nine species groups and all species combined from 2000 to 2010. The number of species evaluated is provided in brackets. "All species" includes also five amphibian and five reptile species not shown separately. ^{xiv} Sources: Finnish Museum of Natural History, Ministry of the Environment and Finnish Environment Institute.

1.2.8 Habitats and species of European importance

Reporting on the European Union Habitats Directive has been carried out in Finland in 2007 and 2013 involving the assessments of species and habitats of European importance. There are 69 habitats in Finland referred to in the Habitats Directive, twenty-two of which are priority types. In 2013 all marine directive habitats and 84% of boreal directive habitats were evaluated as being of unfavourable-inadequate or unfavourable-bad conservation status (Fig 19 A). Only nine boreal habitats were assessed as in favourable condition. In the alpine region the situation was quite the opposite. Nearly 90% of the habitats were evaluated as favourable. There were no genuine class changes in habitats' conservation status between the two reporting rounds.

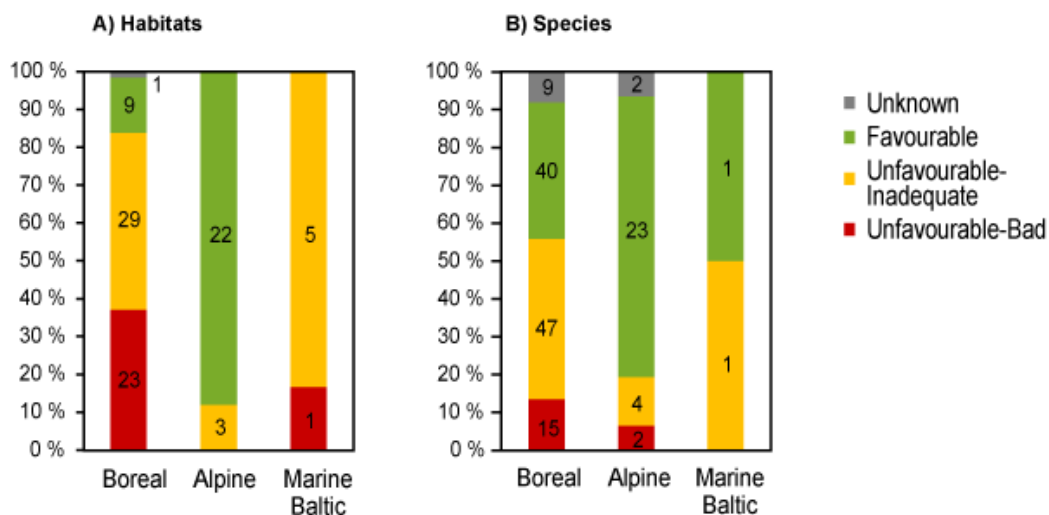


Figure 19. Conservation status of habitats (A) and species (B) mentioned in the European Union Habitats Directive in Finland in 2013.^{xlvi} Source: Finnish Environment Institute.

As for species, 139 species listed in the Habitats Directive occur in Finland. In boreal region more than half of the species were evaluated as having unfavourable-inadequate or unfavourable-bad conservation status (Fig 19 B). On the contrary, 74% of species were evaluated as having favourable status in alpine region. In marine region the status of Baltic grey seal (*Halichoerus grypus*) was favourable and that of ringed seal (*Pusa hispida botnica*) unfavourable-inadequate. The genuine changes in the state of the directive species have been evaluated between the two reporting rounds (Fig 20.). Between 2007 and 2013 negative genuine changes occurred in the case of four species groups: vascular plants (1), mosses (1), fish (2) and mammals (3 species). Only two butterfly species' (*Lopinga achine* and *Lycaena dispar*) status improved between the reporting rounds. All genuine changes of assessed species occurred in the boreal region.

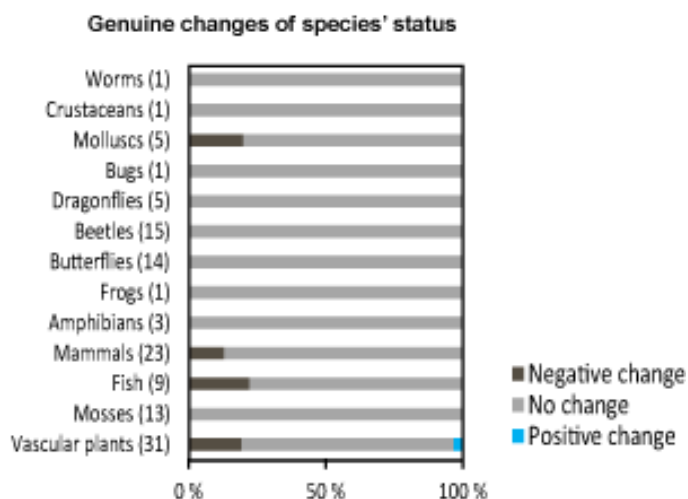


Figure 20. Genuine changes in the conservation status of species mentioned in the European Union Habitats Directive in Finland in 2007 to 2013.^{xlvii} Source: Finnish Environment Institute.

1.3 THREATS TO BIODIVERSITY

Q3: What are the main threats to biodiversity?

No great changes have taken place during the past years concerning the most serious threats to biodiversity. In the latest species red-list assessment of 2010 the most important primary causes of threat were considered to be:

- Changes in the forest environment (31% of all threatened species)
- Overgrowing of meadows and other open habitats (26%)
- Random factors (9%)
- Construction on land (6%)
- Construction of waterways (5%)
- Mining and land extraction (4%)
- Peatland drainage (3%)

This section has been organised primarily according to the threats mentioned above. As in the previous section, reader should refer to national biodiversity indicator collection at www.biodiversity.fi for a more in depth account of threats.

1.3.1 Forestry

In the species red-list assessment of 2000 changes in the forest environment were considered to be the primary cause of threat for 35% of all threatened species. In 2010 this share was estimated at 31% indicating an unchanged or slightly decreasing relative weight of threat from forestry. The most important factors within this class are the decline of dead wood and impacts of forest management activities along with changes in tree species composition and the reduction of old-growth forests. Forest biodiversity is no longer declining as rapidly as previously, but the overall declining trend has not yet been halted. The conservation statuses of 73 forest biotopes have been evaluated in the first assessment of threatened habitat types in Finland in 2008. More than half of the assessed habitats were classified as threatened. This is partly because the assessment criteria are based on the features of natural forests, whereas most of Finland's forests are commercially managed. Measures applied in commercially managed forests are especially crucial in terms of safeguarding biodiversity, since about 90 per cent of Finland's forests are used for commercial forestry.

For the past decades nearly all commercial forests have been managed according to the even-aged management method. Forest patches are clear or seed and shelter tree felled at the end of their rotation cycle, which varies from the minimum of 60 years in herb-rich forest in southern Finland to maximum of 120 dry heath stands in the north. Average size of a clear felled area is 1.5 hectares in southern Finland and less than 5 hectares in northern Finland. After fellings the surface soils of regeneration areas are most often prepared by one of the various methods (Fig. 21 B). The annual area treated with soil preparation has remained quite stable at 110 000 to 125 000 hectares for the past 22 years (Fig. 21 A). This means that approximately 6.5% of total forest area available for wood supply is treated in ten years.

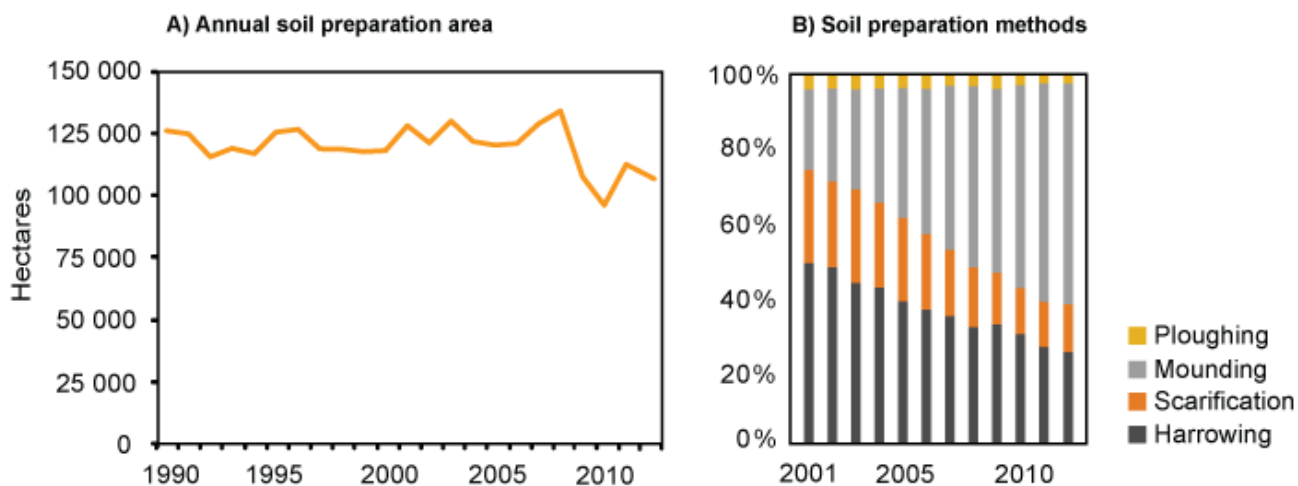


Figure 21. Annual soil preparation area in regeneration felled forests 1990–2012 (A) and share of different soil preparation methods of all soil preparation 2001–2012 (B).^{xlviii} Source: Finnish Forest Research Institute.

Although the total annual area of forest soil preparation has not changed much there have been changes in the methods used. Lighter methods such as mounding have become more common instead of heavy-handed ploughing which was still widely used in early 1990s (Fig. 21 B). Soil preparation reflects the development of threats to forest biodiversity quite well. There has been quite little development in terms of the total areas treated, yet several methods that are less detrimental to biodiversity have been introduced. The new Forest Act, valid from January 2014, acknowledges alternatives to even-aged stands forestry.

1.3.2 Overgrowth of meadows and other open habitats

The second greatest threat is the overgrowing of meadows and other open habitats. Both in 2000 and 2010 this was assessed at the primary cause of threat to 26% of species. There are no comprehensive data on the present extent and development of traditional rural biotopes. Historically the area of meadows crashed from the 1.5 million hectares in the late 19th century to few thousand hectares in 1960s. This resulted mainly from the need to convert meadows to cultivated fields to feed to the growing population. Some 22 000 hectares of traditional rural biotopes are presently being managed with the aid of special contracts within the agri-environmental support scheme. According to latest estimations, there are some 40 000 hectares of traditional rural biotopes in total of which 30 000 hectares are being managed regularly.

The ongoing structural change in Finnish agriculture can be seen in statistics related to animal husbandry. The number of cattle farms has decreased steeply since 1990 (Fig. 22 A). The number of cattle has also decreased, but not as much indicating that the remaining farms are, on average, much bigger than previously. Along with this development small farms keeping a few cows on nearby semi-natural pastures have nearly disappeared. Traditionally these farms were the stronghold of farmland biodiversity. Although large modern cattle farms rarely support high farmland species diversity sometimes even large cattle herds can help maintain threatened habitat types and species associated with them. This is the case with e.g. coastal meadows which have been suffering from overgrowth by common reed (*Phragmites australis*) and other tall growing species. Modern high yield dairy cows cannot graze on traditional rural biotopes, but calvers and beef cattle suit this purpose well. Grazing is also promoted by the increasing share of organic farming.

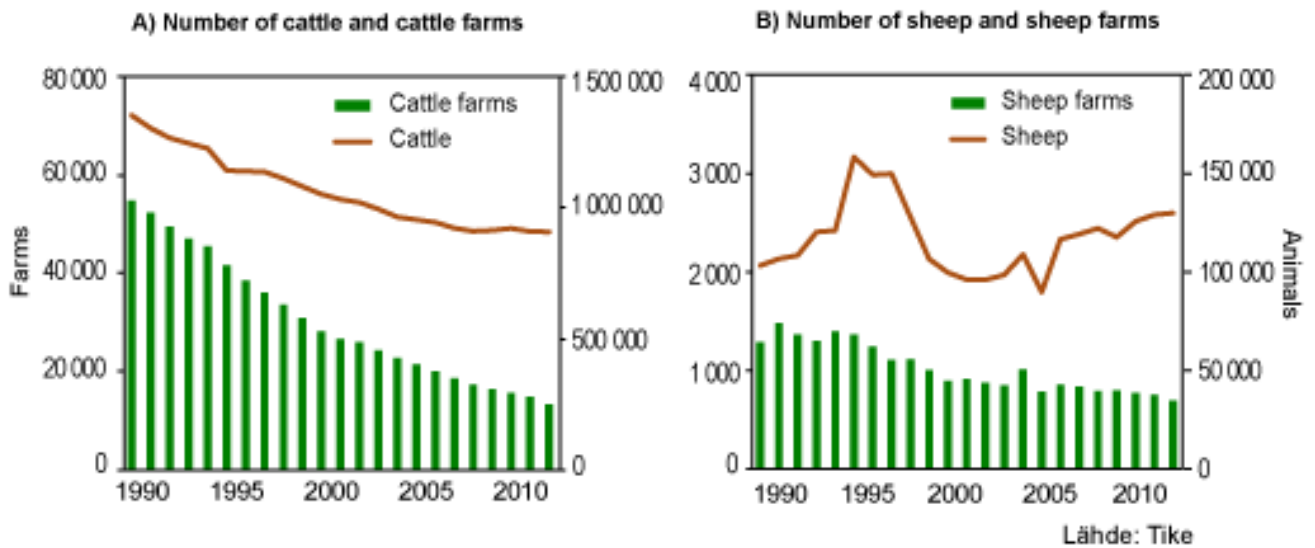


Figure 22. Number of cattle and cattle farms (A) and the number of sheep and sheep farms (B) 1990–2012. In the Finnish context, the number of grazing animals is seen mainly as a positive “pressure” on biodiversity.^{xlix} Source: Tike (Information Centre of the Ministry of Agriculture and Forestry).

1.3.3 Mining, construction and use of aggregates

The impacts of mining are growing as mining activities have increased during the past decade (Fig. 23B). Seven new metal mines have been opened in the country since 2000. Exploration has increased and several projects are in the development stage, mostly in eastern and northern Finland. Active mines and pending mining applications occupy 0.17% of the surface area. The debate concerning environmental impacts of mines has intensified during the last years, and the overall acceptance of mining is questioned. Harmful impacts of mining on biodiversity are still limited to quite a restricted number of species. However, in 2000 mining and extraction of aggregates were estimated as the primary cause of threat to 2% of all endangered species, by 2010 this share had risen to 4%.

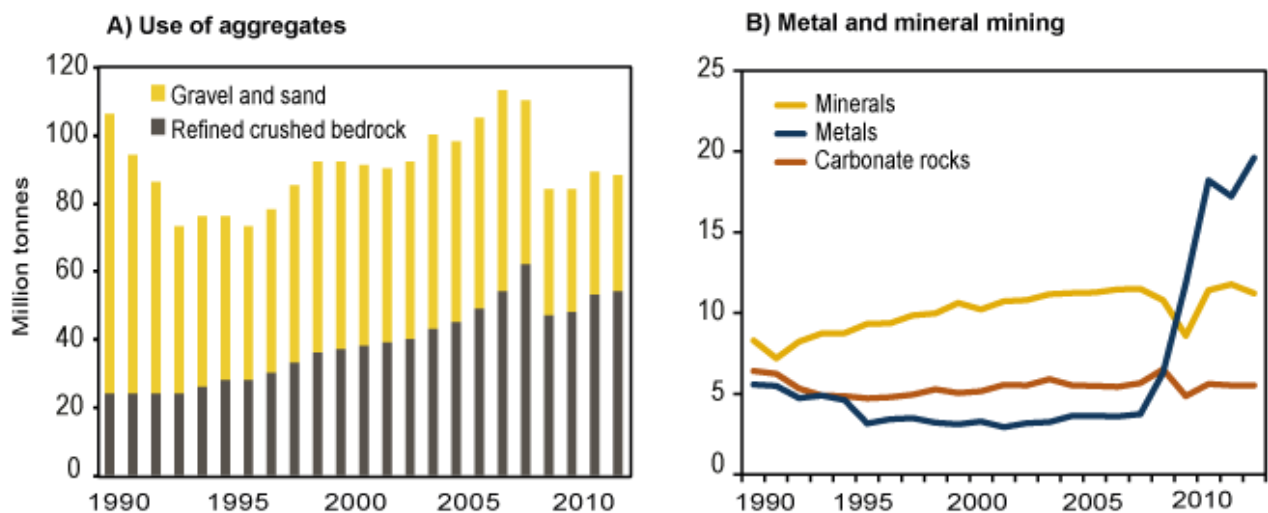


Figure 23. Use of pristine rock materials 1990–2012 (A)ⁱ and total quarrying of minerals, metals and carbonate rocks 1990–2013 (B)ⁱⁱ. Sources: Finnish Environment Institute and Finnish Safety and Chemicals Agency.

The use of aggregates is generally considered a good indicator of construction activity in the society. After a low point in the early 1990s the use of aggregates was increasing until 2008. In 2009 the recession dropped the total consumption back to the 1990s' level (Fig 23A). Increasing recycling and improving knowledge of the suitability of substitutive construction materials for different purposes decreases the demand of aggregates from virgin sources. Construction is regarded as the fourth strongest threat to endangered species being the main cause of threat for 6% and one of causes for 25% of all threatened species.

1.3.4 Draining of mires

The first-time draining on mires for forestry purposes was subsidised by the government until 1990s. Between then and the Second World War altogether 5.7 million hectares, equalling 55% of the original mire area, were drained. Although first-time draining has been quite small-scaled since the turn of the millennium, some draining nevertheless still takes place for peat production, transforming into arable land and using for infrastructure development. Since 2000 these transformations have affected an area measured in tens of thousands of hectares.

In many cases drained peatlands begin to re-paludify if the ditches are not cleaned after a couple of decades. Since 1990 focus has been put on ditch cleaning of previously drained areas. On average, ditch cleanings cover over 70 000 hectares annually in the 1990s and 2000s although the amount has fallen substantially during the past six years (Fig. 24 A). Assessing the total impact mire drainage on biodiversity is difficult due to conflicting trends and poor data (no data on conversion into arable land, for example). Some drained areas are slowly regaining their original water balance in the absence of ditch cleaning operations, some are drained further or are entirely transformed while others are being restored actively. According to the new Forest Act it is not mandatory for forest owners to regenerate peatland forests after harvesting when the growth of trees has not reached certain limit. This regulation will favour restoring those peatlands. From the point of view of mire specialist species (e.g. Fig. 12) the overall trend is still likely to be unfavourable, or, at least, the turn for the opposite direction has not occurred yet. The draining of mires is the primary cause of threat for 3% of all threatened species and one threat among others for 8%.

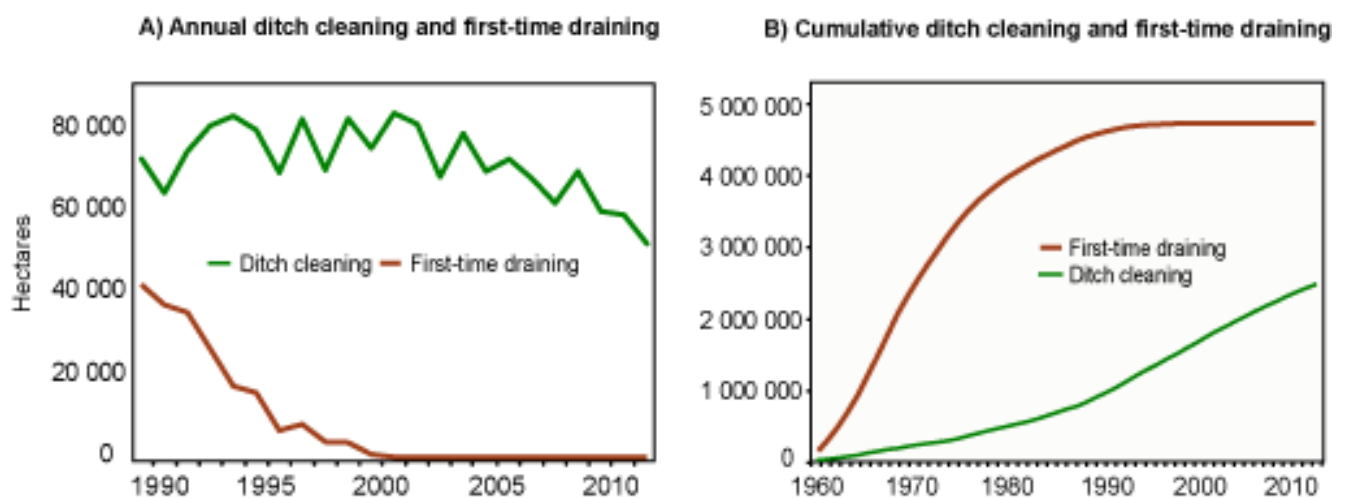


Figure 24. Area of annual first-time draining and ditch cleaning 1990–2012 (A) and cumulative first-time draining and ditch cleaning 1962–2012 (B).ⁱⁱⁱ Source: Finnish Forest Research Institute.

1.3.5 Climate change

Climate change has been assessed as the primary cause of threat of only three species of northernmost Lapland: twite (*Carduelis flavirostris*), an insect in the jumping plantlice group (*Cacopsylla rhododendri*) and dingy fritillary (*Boloria improba*). However, it is still very difficult to evaluate the significance of climate change to species diversity due to lack of information. The same applies to threatened habitat types. Climate change has been assessed as the primary cause of five alpine habitat types which are all environments influenced by the delayed melting of snow.

Thus far the growing season has lengthened by approximately ten days in the southern and central parts of Finland (Fig. 25). In the north the prolongation has been less than one week. Effective temperature sums show a similar trend with the increasing trend getting stronger during the past two decades.

Besides being a threat to northern biodiversity, climate change threatens also reindeer herding, which is the basis of indigenous Saami culture. Extreme weather events and, for example, the icing of the ground layer as a result of a prolonged period of freezing and thawing prior to permanent snow cover can result in high reindeer mortality. Warming climate helps the spreading of southern species, along with them pests such as the deer ked (*Lipoptena cervi*) which is already known to infect reindeer. Perhaps most importantly, however, climate change increases the prospects for the economic utilisation of northern resources such as metallic ores.

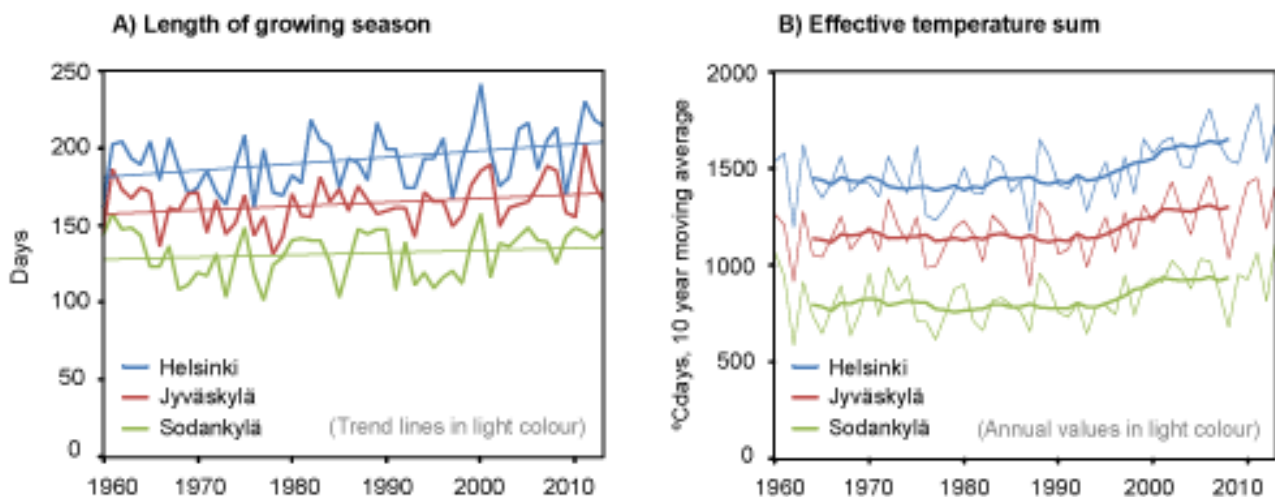


Figure 25. Length of growing season (A) and effective temperature sum (B) in three locations (southern, central and northern Finland) in 1960–2012. ⁱⁱⁱⁱ Source: Finnish Meteorological Institute.

1.3.6 Eutrophication

The most important threat for the Baltic Sea ecosystem is eutrophication. Increased nutrient loads from external sources together with internal loads from sediments and the fixation of atmospheric nitrogen by cyanobacteria cause eutrophication in the Baltic Sea. The total annual amount of nutrients carried into the Baltic Sea by rivers flowing in the Finnish territory varies greatly according to weather circumstances (Fig. 26 A). In years with high precipitation the nutrient amounts tend to be also high. Taking these dynamics into account there seems to be a slight decreasing trend in the phosphorus load during the past two decades while the same does not hold true for nitrogen (not shown). Furthermore, the efforts to decrease the loading from arable and forested land may be compromised by climate change: especially heavy rain events and milder winters increase the leaching of nutrients from fields and forests. Accordingly, there are no clear signs of decreasing nutrient concentrations in the sea water (Fig. 26 B).

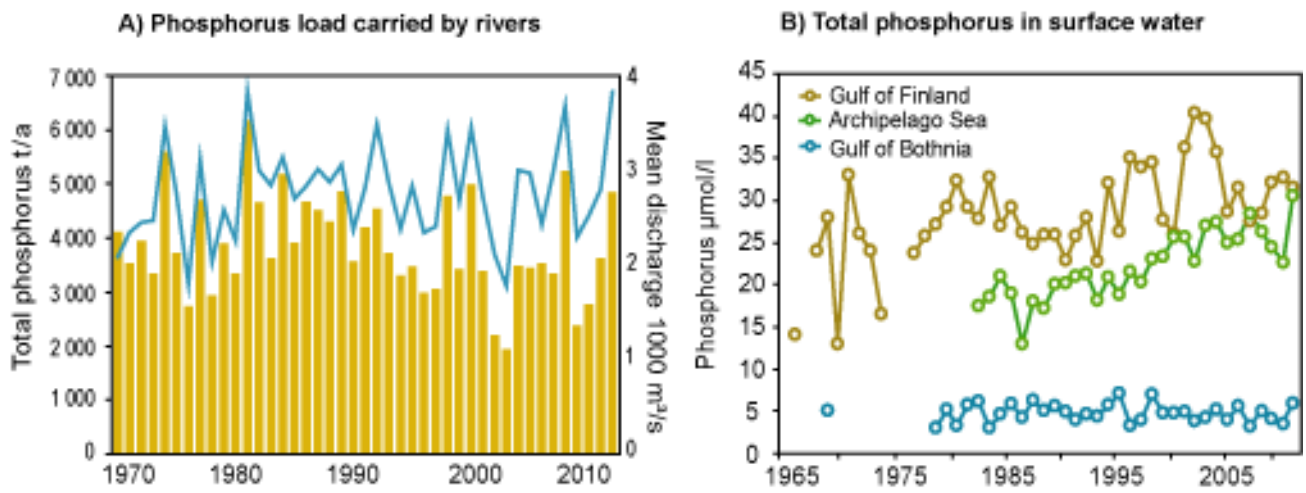


Figure 26. Annual phosphorus load carried by rivers into the Baltic Sea from the Finnish territory 1970–2012 (A) and concentration of phosphorus in surface waters of the coastal zone in different parts of the Baltic Sea 1965–2012 (B)^{liv}. Source: Finnish Environment Institute.

1.4 IMPACTS OF BIODIVERSITY CHANGE

Q4: What are the impacts of the changes in biodiversity for ecosystem services and the socio-economic and cultural implications of these impacts?

Unlike in many other countries, the loss of biodiversity is seldom manifested very concretely in Finland. Because of low human population density, low-share of man-made environment (together urban and agricultural lands cover 10% of total and 14% of land area) as well as comprehensive legislation and law-enforcement, among other things, environmental changes are often subtle, incremental alterations in habitat quality rather than abrupt or apparent transitions from one habitat type to another. Finland has not witnessed, for example, large-scale erosion, desertification, industrial spoiling or urban sprawl. Nevertheless, qualitative changes have been far-reaching. Forests have been influenced by man for centuries, for example through collecting of firewood, tar production and slash-and-burn cultivation. The vast majority of about 91% of the forest land presently available for wood production (i.e. not protected or under restricted use) has been impacted by commercial forest management operations such as clear fellings and the associated soil preparation or artificial regeneration. About 55% of all mires have been drained. Most major rivers have been dammed either for hydropower or for flood protection purposes, or for both. Water levels in 40% of total lake area are being regulated.

Most of the changes described above took place during an approximately 50-year period from 1950s to 1990s. After that, changes in habitat quality have been more limited and partly in the opposite direction. Some of the most detrimental forest management practices such as large-scale clear fellings and deep ploughings of regeneration areas have been discontinued and many new biodiversity-friendly management options such as retention trees and water protection methods have been developed. In forest regeneration domestic tree species adapted to local conditions are used in order to maintain biodiversity and ecosystem functions. Fishways have been constructed next to hydropower dams and lake regulation practices have been adjusted to allow for better consideration of biodiversity values.

The most pronounced changes in the provision of ecosystem services took place simultaneously with habitat quality changes in 1950s to 1980s. Perhaps the most evident developments from the perspective of ordinary citizens have been the loss of migrating Atlantic salmon (*Salmo salar*) from the great rivers of the north due to hydropower development in the late 1940s to the end of 50s, spoiling of many lakes and coastal areas by industrial waste in the 1960s and 70s and the eutrophication of the Baltic Sea – an issue which has been widely debated since the 1980s. Other great changes include decreases in some important game and fish populations such as forest grouse species and salmonid fishes as well as some berry habitats such as those of cloudberry (*Rubus chamaemorus*; a mire species) in southern Finland. All of these have been driven to a considerable extent by habitat quality changes. At the same time, however, the socio-economic impacts of biodiversity changes have been lessened by changes in both the society and ecology. On one hand, the importance of hunting, fishing and berry picking as sources of income and subsistence have diminished and, on the other hand, other species have become more important as catch. The Eurasian elk (*Alces alces*), for example, has increased manifold in numbers and is now economically the most important game species.

There is a high demand for nearby natural areas and this demand is not always satisfied by the present green and blue infrastructure. Many Finns seek natural forests, un-drained mires, pure waters and undisturbed fell landscapes to spend their past-time in and next to. This can be seen in the rapid growth in the visits to national parks (see section 1.1.3). In terms of recreation Finns have benefitted from the expansion of the network of protected areas, especially of that of national parks. The latest additions to the list of national parks were Bothnian Sea and Sipoonkorpi National Parks, which were both established in 2011. The process to establish two new national parks in southern Finland is ongoing.

The recreational use of natural areas was monitored in two national follow-up studies, implemented in 1998–2000 and 2009–2010 in line with the VILMAT (programme for developing recreation and nature tourism) action plan 2003–2012. The studies found that 96 percent of the Finnish population engages in outdoor activities approximately 2–3 times per week. More than 30 percent of local outdoor recreation consists of walking. Almost two thirds of outdoor recreation takes place in municipal areas and one third on privately-owned land or at leisure houses. The remaining six percent take place in state-owned areas. The use of municipal recreation areas has increased over the last ten years. In general, around two thirds of the recreation facilities are located within walking distance of habitations. The amount of time spent on one outdoor recreational exercise is the same in both rural and urban areas. Around 43 percent of Finns take part in one or more overnight excursion in nature each year. The number has increased slightly over ten years. The excursions in nature are divided as follows: one third takes place at leisure houses, 28 percent on privately-owned land, one fifth on state-owned land and the rest in municipal areas.

Thus far the economic impacts of invasive alien species (IAS) have not been evaluated in detail in Finland. According to expert judgement based on the list of identified IAS and the evaluations made in Europe and, especially, in Sweden, the costs are likely to be measured in tens of millions if not hundreds of millions of euros per year. Even the costs of disease and pest control, prevention and monitoring amount to several million euros per year. The estimated costs that could arise from a single finding of pine wood nematode (*Bursaphelenchus xylophilus*) finding are estimated at 11–26 million euros. Alongside with economic impact IAS can pose a health threat or act as vectors of disease. Giant hogweed species (*Heraclium mategazzianum*, *H. persicum* and *H. sosnowskyi*) can cause serious skin problems and common ragweed (*Ambrosia artemisiifolia*) allergy whereas American mink (*Mustela vison*), raccoon dog (*Nyctereutes procyonoides*) and feral or stray cat (*Felis catus*) may spread rabies. IAS also damage infrastructure as is the case of dark false mussel (*Mytilopsis leucophaeata*), which clogs up water pipes at power stations.

Because of its close ties to nature, the impacts of biodiversity change are particularly acute on the Saami culture. The status of biodiversity has declined in the Saami Homeland due to large scale societal processes that began several decades ago. Many of the changes relate to reindeer herding. The spreading of infrastructure and introduction of modern forest management have fragmented reindeer pastures. The Saami reindeer herding is based on an annual pasture rotation cycle in which reindeer move between different grazing areas according to season. Rotation ensures sufficient time for the recovery of vegetation in low productive habitats. Successful pasture rotation requires large undisturbed and unfragmented areas, which have been shrinking especially in the southern parts of the Saami Homeland. Decrease in the economic profitability of reindeer herding has forced many herding cooperatives to increase their reindeer numbers. This, in turn, has led to a decrease in the quality of lichen pastures and the need to provide supplementary feeding during winters.

PART II:
NATIONAL BIODIVERSITY
STRATEGY AND
ACTION PLAN AND
THE MAINSTREAMING
OF BIODIVERSITY



2.1 FINLAND'S BIODIVERSITY TARGETS

Q5: What are the biodiversity targets set by your country?

In line with the programme of the current Finnish Government, led by Prime Minister Jyrki Katainen, *Finland's National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity* has been updated to correspond to objectives defined under the Convention on Biological Diversity (CBD) and within the European Union. On 20 December 2012, the Government made a resolution approving the new Strategy for the Conservation and Sustainable Use of Biodiversity in Finland for the years 2012–2020 (*Saving nature for people*).

The Strategy for the Conservation and Sustainable Use of Biodiversity in Finland for 2012–2020 is based on all of the issues covered by the CBD. It aims to promote the ecologically, economically, socially and culturally sustainable utilisation and development of biodiversity and natural resources in Finland, while safeguarding biodiversity, the vital needs of future generations, and livelihoods based on natural resources. The Government has defined the following goals as the basis of the strategy:

Vision

By 2020, biodiversity loss in Finland will have been halted. The favourable status of biodiversity and ecosystem services will be ensured by 2050. Finland will protect and sustainably utilise biodiversity for its own intrinsic value and as a source of human well-being, while taking active responsibility for issues related to biodiversity in international contexts. The Government believes that wide-ranging actions, changes in attitudes and processes, and enhanced cooperation will all be needed to achieve the goals described above. These actions must be based on the following principles:

Mission

Finland will urgently undertake effective actions designed to halt the loss of biodiversity by 2020 and ensure that by 2050 the state of the natural environment in Finland is stable and capable of ensuring people's future well-being. To achieve this:

- Issues and values related to biodiversity must become fundamental elements in decision-making.
- The pressures facing biodiversity must be reduced.
- Collaboration between the authorities, citizens, businesses and stakeholders and related participation procedures must be enhanced. New forms of cooperation designed to prevent and minimise any harmful impacts on biodiversity must be realised at a timely point in the preparation of decisions on projects and plans.
- Degraded ecosystems must be restored cost-effectively, or left to revert to their natural state through natural processes.
- Natural resources must be utilised sustainably. Renewable natural resources must be used in economic activities and to increase well-being in ways that ensure they are not depleted, but are renewed for the benefit of future generations. Non-renewable resources must be used as eco-efficiently as possible. In this way the present generation will not endanger the prospects of future generations to enjoy a good life in a sustainable society.
- Actions related to the conservation and sustainable use of biodiversity must be realised effectively with due regard to citizens' constitutional property rights and Finland's traditional everyman's right of access to the land, while also ensuring that all citizens meet their responsibility to preserve biodiversity. The indigenous Saami community's traditional knowledge related to biodiversity will be respected.
- Decisions related to biodiversity must be based on the best available scientific information, and also apply the precautionary approach.
- Finland will take responsibility for ensuring access to genetic resources and the fair and equitable sharing of benefits arising from their utilisation.

Government approved five strategic goals and 20 more specific related targets as guidelines for the conservation and sustainable use of biodiversity in Finland. These guidelines have been defined with reference to conditions in Finland, in order to comply with the goals defined at the Conference of the Parties, COP at its tenth meeting and the targets set in the EU's biodiversity strategy. They form a flexible framework capable of responding to Finland's national needs and priorities.

The Government has assigned the relevant ministries to implement this strategy by working in cooperation with civil society, commercial interests and other stakeholders to create a cost-effective and purposeful action plan that contains quantitative and qualitative bases for monitoring. The action plan will implement the goals and targets defined in the strategy while giving due consideration to national needs and priorities. It will be implemented within spending limits defined in central government budget frameworks. Progress on the implementation of the strategy and action plan will be monitored and assessed, with findings reported to the Government in 2015.

STRATEGIC GOAL 1: MAINSTREAM THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY ACROSS GOVERNMENT AND SOCIETY.

Targets for 2020:

Target 1. Finnish people have at least a basic knowledge of biodiversity and are aware of its significance and their own opportunities to contribute to its conservation and sustainable use.

Target 2. Biodiversity values have been internalised. Alternative indicators to GNP have been adopted to measure how well sustainable development objectives have been realised. The goal of conserving biodiversity has also been integrated into decision-making on plans, programmes and projects.

Target 3. Incentives and subsidies harmful to biodiversity have been identified and reformed, and economic controls related to biodiversity have been enhanced, taking into account national socioeconomic and cultural conditions.

Target 4. Administration, business, civil society and stakeholders at all levels promote and implement plans for sustainable production and consumption, and keep the impacts of natural resource use within safe ecological limits.

STRATEGIC GOAL 2. REDUCE THE DIRECT PRESSURES ON BIODIVERSITY AND PROMOTE ITS SUSTAINABLE USE.

Targets for 2020:

Target 5. The loss of all natural habitats has been halted, and the degradation and fragmentation of natural habitats have been significantly reduced.

Target 6. All aquatic biotic resources are managed and utilised sustainably, applying an ecosystem-based approach. The concept of maximum sustainable yield (MSY) is applied in fisheries. Living natural resources are utilised within safe ecological limits.

Fish stock management plans are drafted for all threatened fish populations and where necessary for commercially fished populations and groups of populations. Fisheries have no significant adverse impacts on threatened species or vulnerable ecosystems. Fish migration routes and spawning areas are safeguarded in waters of importance to migratory fish and commercially fished species. Depleted fish stocks are strengthened and native fish populations restored with the help of introductions.

Target 7. Areas under agriculture, aquaculture and forestry are managed and utilised sustainably, ensuring the conservation of biodiversity.

Target 8. Environmental pollutants and their harmful emissions, including the excess nutrients that cause eutrophication, have been reduced to levels that are not detrimental to biodiversity and the functioning of ecosystems.

Target 9. Invasive alien species and their pathways have been identified and prioritised, with the most harmful species brought under control. Pathways are monitored to prevent the introduction and establishment of invasive alien species in Finland.

Target for 2015:

Target 10. The multiple anthropogenic pressures on threatened ecosystems impacted by climate change have been reduced so as to maintain their integrity and functioning.

STRATEGIC GOAL 3. IMPROVE THE STATUS OF BIODIVERSITY BY SAFEGUARDING ECOSYSTEMS, SPECIES AND GENETIC DIVERSITY.

Targets for 2020:

Target 11. Finland's network of protected areas and the measures applied to conserve biodiversity in the use of other areas together cover at least 17 per cent of the terrestrial environments and inland waters of the country, and 10 per cent of coastal and marine areas. The functionality and coverage of the network have particularly been improved in Southern Finland. Protected areas are suitably managed and ecologically and regionally representative. They are well connected, and green infrastructure also connects them to wider landscape entities, with regard to the special features of heritage landscapes. Biodiversity also continues to be safeguarded in commercially managed forests.

Target 12. The extinction of threatened species has been prevented in Finland and the conservation statuses of those most threatened have been improved, with declining trends halted.

Target 13. The genetic biodiversity of Finland's cultivated plants and their wild relatives, forest trees, fish stocks, and farmed and domesticated animals has been preserved and safeguarded.

STRATEGIC GOAL 4. SAFEGUARD THE BENEFITS TO ALL FROM BIODIVERSITY AND ECOSYSTEM SERVICES.

Targets for 2020:

Target 14. Ecosystems that provide essential services, including services related to water, health, livelihoods and well-being, are restored and safeguarded, taking into account socioeconomic and cultural considerations, notably the needs of the indigenous Saami community.

Target 15. Ecosystem resilience and the contribution of biodiversity to carbon stocks have been enhanced through conservation and restoration. Finland participates in global efforts to restore at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification. The impacts of the increased use of bioenergy on biodiversity and the nutrient and carbon cycles of forests have been assessed, and guidelines have been set to safeguard biodiversity. Urban biodiversity is enhanced through conservation measures, management measures and the provision of structures that promote biodiversity.

Target for 2015:

Target 16. The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation has been enforced and integrated into national legislation and administrative practices.

STRATEGIC GOAL 5. ENHANCE IMPLEMENTATION OF THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY THROUGH PARTICIPATORY PLANNING, KNOWLEDGE MANAGEMENT AND CAPACITY BUILDING.

Target for 2015:

Target 17. The implementation and impacts of the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland have been monitored for the purposes of an interim report produced in 2015. The strategy will be implemented and evaluated cost-effectively in collaboration with various businesses and other stakeholders.

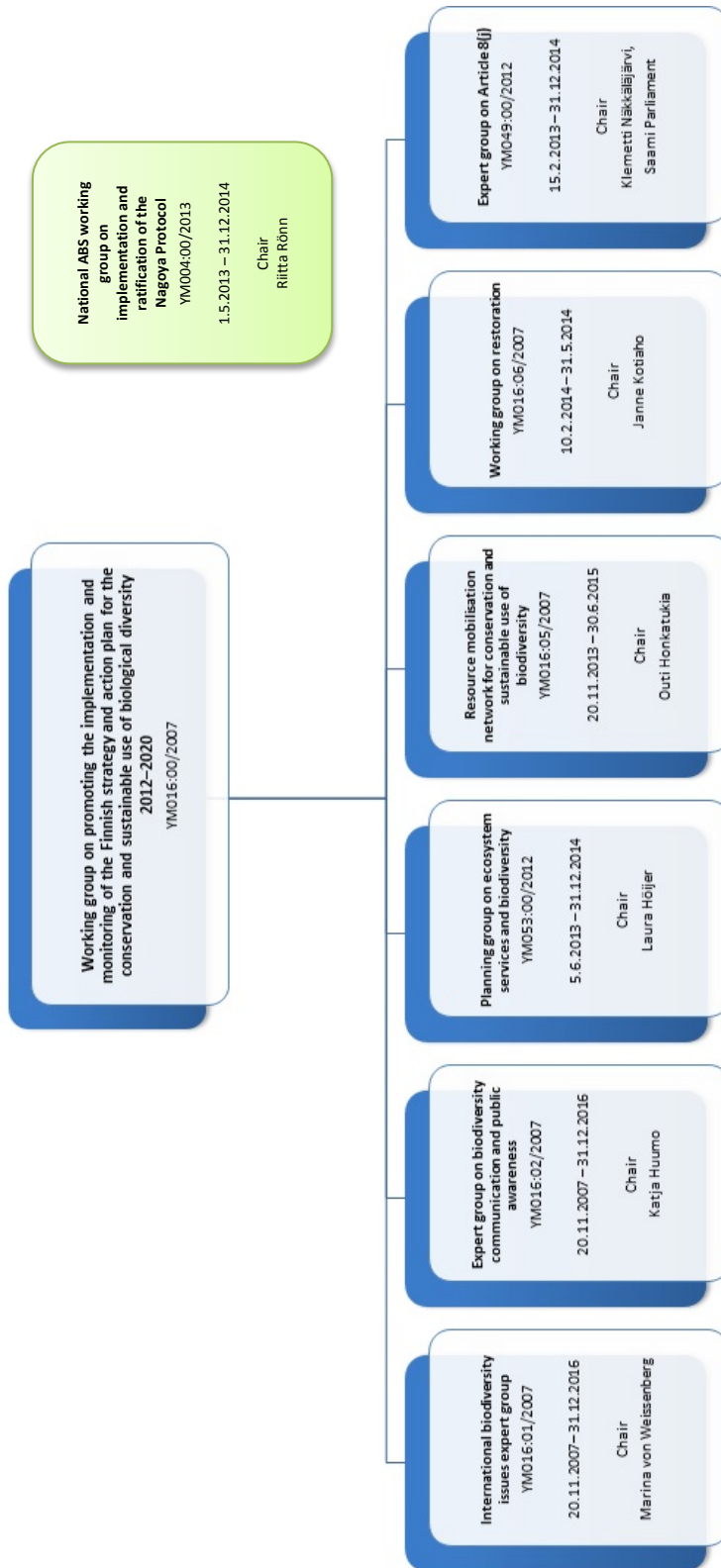
Targets for 2020:

Target 18. The traditional knowledge, innovations and practices of the indigenous Saami community relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, restored and conserved, subject to national legislation and relevant international obligations, by developing legislation and administrative procedures related to the protection of this traditional knowledge. Finland's implementation of the CBD allows for the full and effective participation of the Saami community at all relevant levels in line with decisions set out in the CBD and by COPs.

Target 19. Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends have been improved, and are widely utilised, applied and transferred to those needing such knowledge and technology. The impact assessment processes for plans and projects are open, participatory, and based on professionally conducted inventories whose quality is assured.

Target 20. Finland assesses opportunities to increase the availability of financial, human and technical resources to facilitate the effective implementation of the Strategic Plan for Biodiversity 2011–2020 as drawn up at CBD COP 10 and in line with decisions made at COP 11. Finland strives to obtain resources from all appropriate sources in accordance with the consolidated and agreed process defined in the Strategy for Resource Mobilization. National implementation depends on the availability of resources within spending limits set out in central government budget frameworks. This work will be steered in line with the needs assessments that are developed and reported by all Parties to the CBD.

Figure 27. The organisation of the national implementation of the Convention of Biological Diversity in Finland



2.2 UPDATING OF THE NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN

Q6: How has your national biodiversity strategy and action plan been updated to incorporate these targets and to serve as an effective instrument to mainstream biodiversity?

The Government of Finland made the 20th of December a resolution on the 2012–2020 strategy for the conservation and sustainable use of biodiversity in Finland. Entitled *Saving Nature for People*, the strategy's main goal is halting biodiversity loss in Finland by 2020. The new strategy replaces the 2006–2016 national strategy. The decision to update the previous strategy formed part of the Government Programme of Prime Minister Jyrki Katainen.

The new national biodiversity strategy rests on a solid basis in terms of international agreements. It will implement the decisions made in 2010 at the meeting of the Conference of the Parties to the Convention on Biological Diversity (COP-10), intended to improve the global implementation of the Convention. The strategy also takes account of the objectives of the European Union Biodiversity Strategy, and is based on a number of comprehensive national studies on the state of biodiversity in Finland and the factors influencing it.

The Government Programme was released on 22 June 2011. One of the programme goals was to: "Update the strategy and action plan for the conservation and sustainable use of biodiversity in Finland, to make it correspond to the objectives defined under the Convention on Biological Diversity and within the European Union. The strategy will be implemented so as to safeguard the ways in which Finland's indigenous Saami People traditionally utilise nature." This enabled the biodiversity monitoring group to continue drafting the strategy consistently with the policies of the previous government. Active cooperation with civil society continued to be a part of the NBSAP drafting process, executed as open communication and with the help of online tools. The aim was to make the NBSAP compliant with the Aichi targets to the broadest extent possible and to engage in close cooperation with civil society in the drafting process. The Aichi targets were introduced to the citizens, who were then asked to provide their ideas for the development of the revised NBSAP and on the national implementation of the Aichi targets. Thus, the first round of the civil society discussions was organised without a predefined structure or content plan. The feedback received was ample and insightful. The action plan was prepared alongside the strategy and approved by the appropriate ministries on 26 March 2013.

2.2.1 Bringing the environment into the mainstream

Biodiversity cannot be safeguarded by traditional nature conservation measures alone. The input of society as a whole is required. The strategy places economic and cultural values related to biodiversity at the heart of decision-making on the use of natural resources.

The strategy's five objectives focus on the mainstreaming of environmental issues across society, the introduction of new participants in the work to advance environmental causes, a decision-making process based on robust research data, and Finland's responsibility, as a member of the international community, for the global environment. The strategy also outlines policies linking the Saami community's traditional knowledge to the protection of biodiversity.

Particular attention is paid to sustainable use of natural resources. Renewable resources should be used in a manner that ensures their genuine renewal and does not diminish them, while non-renewable resources should be used as eco-efficiently as possible.

2.2.2 Taking account of managed habitats

The strategy also draws attention to the biodiversity of agricultural habitats, since as much as 93 per cent of traditional rural biotopes are under threat. According to the government resolution, during the next EU funding period agri-environmental subsidies will be allocated to measures rendering environmental protection and nature management more efficient, while environmental support criteria are made more incentive-based and subject to stronger financial conditions. New measures will be developed to manage traditional rural biotopes outside farms.

Urban and other heavily managed habitats have also proven very important to nature. For example, a number of threatened species live on railway embankments and in groundwater ponds in gravel pits. Urban nature also provides vital spaces for human recreation. Finland must therefore align species protection with land-use planning and the management of green spaces, while encouraging new solutions that enrich our habitats.

Finland is also committed to the ratification of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization.

2.2.3 Cooperation in a key role

The strategy was prepared with the help of unusually broad cooperation. The strategy review was steered by the Ministry of the Environment, which appointed a broad-based biodiversity working group to discuss the strategy drafts and the results of feedback from workshops and individual citizens. During the strategy drafting stage, hundreds of people across Finland were able to participate in the work, though online consultations and live debates.

Cooperation will continue to play a key role in the achievement of the strategy's objectives. The strategy will be implemented through the Action plan, developed with the help of broad-based cooperation between ministries, NGOs, stakeholders and various economic sectors. The draft action plan currently includes 105 measures. The plan was finalised in March 2013.

- *The Strategic Plan for Biodiversity and the CBD Secretariat* <http://www.cbd.int/sp/>
- *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*

Parallel to the drafting of the new national biodiversity strategy, the government assigned the relevant ministries working in a broad-based national Biodiversity Committee in cooperation with civil society, commercial interests and other stakeholders to revise a cost-effective and purposeful action plan to ensure the implementation of the strategy. The action plan contains quantitative and qualitative bases for monitoring. The National Biodiversity Committee approved the revised National Biodiversity Action Plan 2013–2020 in March 2013.

The action plan implement the goals and targets defined in this strategy while giving due consideration to national needs and priorities. It will be implemented within spending limits defined in central government budget frameworks. Progress on the implementation of the strategy and action plan will be monitored and assessed, with the findings being reported to the Government in 2015.

The Biodiversity Committee includes representatives of the relevant key national actors from the public and private sectors, as well as stakeholder groups and non-governmental organisations. Feedback received from citizens through the Webropol survey is included at several points in the action plan.

The national action plan, which is based on and implements the above strategy, includes 105 measures. These have been introduced alongside specification of the ministries responsible for them and their target schedules.

For each measure, the ministry bearing main responsibility is mentioned first, and the other participating ministries are referred to in the order laid down in section 1 of the Government *175/2003*.

Measures are implemented not only by ministries, but also by the agencies and bodies within the ministries' administrative branch (such as sectoral research institutes), stakeholders who contributed to the preparation of the strategy and action plan, as well as non-governmental organisations and stakeholder groups. These play an essential role in integrating the strategy and action plan with Finnish society, the business sector and the everyday lives of citizens.

As part of the action plan, Finland will implement the objectives for Member States included in the EU Biodiversity Strategy to 2020, and the related measures. In Finland we have been following the CBD strategic plan and the Aichi targets strictly when formulating our national targets and needs. Herewith Finland will meet the aim set to Parties in contributing to the SP decided on in Nagoya 2010.

Measures included in the action plan were formulated in cooperation between the members of the Biodiversity working group on implementation and monitoring. They were categorised in line with the strategic goals and targets defined in the Strategy for the Conservation and Sustainable Use of Biodiversity in Finland.

Background issues related to challenges and measures are described in an appendix of the NBSAP.

For more information see: <http://www.ym.fi/en-US/Nature/Biodiversity>

2.2.4 Cross-cutting measures and challenges

2.2.4.1 Communication and enhancing public awareness

Development challenges

Loss of biodiversity is still overshadowed by other environmental problems, despite the fact that more weight and visibility have been given to biodiversity issues in recent years. Traditional nature conservation issues related to individual species and conservation areas arise more easily as topics of debate. The connections between biodiversity loss to issues such as the degradation of ecosystem services due to climate change have attracted less attention. In order to enhance general awareness and that of communications work, the loss of biodiversity should be more closely linked to other key environmental issues, such as climate change, the services obtained by people from nature, food safety, human well-being and protection of water resources. Biodiversity is also vital to plant breeding and thus to national and global food security. Conservation of genetic resources will secure their availability to meet the needs of farmers, plant and animal breeding and research, and future generations. Finland's international responsibility for biodiversity and the related connections between biological resources and poverty should also be highlighted more clearly.

On a European scale, the Finnish people are fairly familiar with biodiversity as a concept (Eurobarometer 2007 and 2010, Fig 28.), while being the least concerned of EU citizens about loss of biodiversity. With the help of communications work citizens will become aware of situations causing concern and will be encouraged to take an interest in biodiversity more widely, and support decisions made to safeguard biodiversity.

Measures, responsible bodies and target schedules

The safeguarding of biodiversity and its associated services provided by nature has become a common interest for different groups of citizens and sectors of industry and business, rather than the concern of only certain groups or professions. In communications work, the strategic key aim is to mainstream biodiversity in such a way that an increasing number of groups and actors within society take ownership of the issue. Another goal, parallel to enhancing knowledge and shaping attitudes, is to encourage individuals, authorities and industries to change their activities in a way that favours the safeguarding of biodiversity and the sustainable use of the associated ecosystem services. With the help of communications work citizens will be able to participate better in the national debate on genetically modified organisms (Section 5.2). Another aim is to establish and deepen partnerships with parties outside central government, in order to communicate more effectively and with a

sharper focus. Communications work will be specifically aimed at target groups whose actions will have the most impact on the safeguarding of biodiversity and who will be identified in the updated communications programme of the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity 2012–2020 entitled *Saving Nature for People*. Efforts to promote the mainstreaming of biodiversity are required not only among children and young people, but also in the adult working age population.

1) Update and implement the communications programme of the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity 2009–2016 to support the policy definitions of the global biodiversity strategy and action plan 2010–2020, revised in Nagoya, Japan (CBD COP-10, 2010). The communications programme will include information on the Nagoya ABS Protocol, on access to genetic resources and the fair and equitable sharing of benefits arising from their utilisation.

- Ministry of the Environment, Ministry for Foreign Affairs, Ministry of Defence, Ministry of Education and Culture, Ministry of Agriculture and Forestry, Ministry of Transport and Communications, Saami Parliament (2013)

2.2.4.2 Education and training

Development challenges

In line with the programme of the current Government, led by Prime Minister Jyrki Katainen, Finland will aim to lead the way in efforts to protect biodiversity and mitigate climate change. The intention is to develop Finland into the world's most environmentally-conscious nation. This poses a challenge in terms of general and vocational education, as well as the environmental education of citizens. The Government programme also seeks to strengthen the status of environmental education and develop nature schools, while creating opportunities for children and young people to participate and be heard in decision-making relating to their own neighbourhood environment and on environmental policy.

The educational sector will seek to convey the latest research data on biodiversity, alongside the factors influencing such data, to students. To achieve this goal, closer cooperation between environmental researchers, environmental administration and actors engaged in educational development is important. Vocational education, too, requires national data on diversity, information on endangered species, and habitat types. Moreover, it is important to anticipate which practices of business and professions pose risks to biodiversity and ecosystem services, how such risks can be managed and prevented, and which sectors promote the protection of biodiversity.

Sufficient knowledge of species is necessary in order to be able to understand nature and the structure and functioning of ecosystems. In Finland, it has been found that both schoolchildren and pedagogy students have poor knowledge of species. In response, education on plant species has been given more weight in the basic school curriculum. Easy access to materials is vital to the development of education and to educational institutions. Schools have a growing need for information, particularly concerning their immediate surroundings. The collection of plants, an activity that has now been reinstated in the curriculum, requires that biodiversity monitoring data be accessible to teachers and students, also in digital format.

Visitor centres belonging to Metsähallitus (a state-run forest enterprise), natural history museums of universities and municipalities, botanical gardens, nature schools and zoological gardens promote a general awareness of nature and provide learning environments for teaching and education. Although schools and educational institutions use the services of such establishments for teaching purposes, more extensive use of them and their broad customer base could be made for teaching purposes. In addition, teaching and learning activities could be developed in cooperation with the environmental and educational administrations. Centres for economic development, transport and the environment, the Finnish Forest Centre and municipalities could also play a key role in distributing local and regional information to schools, as could NGOs (e.g. the Finnish scout association Suomen Partiolaiset – Finlands Scouter ry, Finnish Nature League – Luonto-Liitto) and the umbrella organisation of the environmental education sector — Suomen Ympäristökasvatuksen Seura, the Association for

Environmental Education in Finland. Likewise, teachers' organisations and pedagogical associations (e.g. the union of biology and geography teachers BMOL and the association of agricultural and forestry teachers MMO), whose work is related to this theme, could be important partners.

Measures, responsible bodies and target schedules

Efforts to promote environmental education related to biodiversity will extend from day care and pre-primary school to higher education; for example, by developing forms of cooperation, enhancing teachers' pedagogical skills and knowledge of species, and promoting sustainable development, including education and training in support of the conservation of biodiversity and the sustainable use of natural resources.

2) Continuing education for teachers in species knowledge and pedagogy in biodiversity issues will be developed. With the help of new information technology, species knowledge and sustainable development education will be promoted (e.g. traditional knowledge of and protection and respect for biodiversity will be included in educational programmes for the Saami people, and in the production of related learning materials).

- Ministry of Education and Culture, Saami Parliament (2013–2020)

3) The position of environmental education will be strengthened in the imminent overhaul of the national curriculum. In addition, in vocational education, professional skill requirements related to restoring and conserving biodiversity will be strengthened.

- Ministry of Education and Culture (2013–2015)

4) Cooperation related to multifaceted environmental education on biodiversity will be developed, for instance, between the administration, research institutions, educational institutions, centres for economic development, transport and the environment (ELY Centres), natural history museums, Metsähallitus Visitor Centres and non-governmental organisations. Additional, practical cooperation projects will be implemented and the results gained from them will be monitored. More effective measures for enhancing awareness of biodiversity in various target groups will be jointly identified.

- Ministry of Education and Culture, Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

2.2.4.3 Financial instruments and other measures

Development challenges

Extensive practical application of voluntary conservation actions and the development of incentives and advisory services on nature management and conservation, for instance concerning forest environments, are essential prerequisites for safeguarding biodiversity in the current decade. The targeting of agriculture and environmental management in rural areas at locations and for purposes considered key to biodiversity is another important task, alongside communications work, advisory services and practical guidelines. This goal is promoted by safeguarding the operating conditions of Finnish food production that help to direct environmental management in agriculture towards the conservation of biodiversity and the sustainable use of natural resources.

In accordance with the Government programme of Prime Minister Jyrki Katainen, in order to promote sustainable development, subsidies that are detrimental to the environment will be identified and reallocated, taking social, economic and cultural conditions into account. Simultaneously, ways will be investigated of fulfilling environmental commitments more cost-efficiently, through the development of economic instruments. The aim is to enhance the understanding of how biodiversity and the economy are linked, and to examine appropriate and cost-efficient economic steering methods for promoting the conservation and management of biodiversity and fostering sustainable use. For instance, agri-environmental support will be reformed in order to promote the

conservation of bodies of water and biodiversity more efficiently than at present. Agri-environmental aid measures will be focused regionally and on certain farms and parcels in the areas considered most sensitive in terms of water protection and biodiversity.

Another goal in the Government programme is to identify innovative funding sources for the protection of biodiversity, and to investigate the establishment of a protection fund for channelling private and public donations towards nature conservation. In addition, information will be provided regarding the possibility of creating non-compensation-based protected areas.

Another challenge lies in developing sustainable development and well-being indicators for Finnish society, which would complement GDP data. These new indicators would describe biodiversity and ecosystem services. This would contribute to better decision-making that takes into account biodiversity and the ecosystem services dependent upon it.

Measures, responsible bodies and target schedules

5) Identify subsidies that are detrimental to biodiversity and reallocate them, taking social, economic and cultural conditions into account. Examine how biodiversity commitments can be fulfilled more cost-efficiently, by developing economic instruments such as incentives and taxation.

- Ministry of Finance, Ministry of Agriculture and Forestry, Ministry of Employment and the Economy, Ministry of Transport and Communications, Ministry of the Environment (2013–2015)

6) Continue to develop a monitoring system for the state of and trends in biodiversity in Finland through a network of experts. Monitoring results will be published on the Biodiversity.fi website in particular, which will be maintained as a national system for communications and reporting on the general monitoring of biodiversity. Monitoring will be expanded through indicators describing the status of and trends in ecosystem services; the indicators will be developed in cooperation with researchers and users of information. These indicators will be added to the Luonnontila.fi website. More efficient use will be made of indicators for biodiversity and ecosystem services, in decision-making and the evaluation of the implementation of the action plan. The role of such indicators will be strengthened in the measurement of sustainable development and well-being in Finland.

- Ministry of the Environment, Prime Minister's Office, Ministry of Finance, Ministry of Education and Culture, Ministry of Agriculture and Forestry, Ministry of Employment and the Economy (2013–2015)
- Development of indicators for the fifth national report on the CBD Convention by the end of 2014

7) Initiate cooperation with the private and third sector in identifying innovative funding opportunities that promote biodiversity.

- Ministry of the Environment, Ministry of Finance (2013–2020)

8) Strive to secure funding opportunities for the conservation of biodiversity in national and EU-level preparations for the European Union's next programming period.

- Ministry of Agriculture and Forestry, Ministry of Employment and the Economy, Ministry of the Environment (2013–2014)

9) Agri-environmental support will be reformed to promote the conservation of bodies of water and biodiversity more efficiently than at present. Agri-environmental support measures will be focused regionally and on certain farms and parcels, in the areas considered most sensitive in terms of water protection and biodiversity.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2013)

10) In reindeer herding areas, compensation will be given in full for any damage caused by predators to reindeer owners, insofar as possible. Outside the reindeer herding area, the primary aim is to prevent any damage caused by large carnivores to the owners of domestic and pet animals. Attempts will be made to ensure the continuity of the compensation scheme for seal damage and of subsidies for seal-proof traps.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

2.2.4.4 Legislation

Development challenges

Implementation of nature conservation has largely been based on legislative and administrative steering methods. Assessments of threatened species show that legislation on nature conservation, either alone or combined with other environmental protection legislation, has been unable to prevent the decline in biodiversity. Protection methods included in nature conservation legislation are insufficient to prevent losses of diversity related to changes in land use and the economic structure. In land use planning and the legislation that governs it, as well as in decision-making, more attention will be paid to how natural areas are interconnected, the conservation of biodiversity at the landscape level even outside conservation areas, and the maintenance of ecosystem services, while taking into account other land use needs. Measures that support biodiversity may also require economic incentives and the use of compensation.

The resources available to central government, including the nature conservation administration, are diminishing. Attention must be paid not only to biodiversity, but also to the cost efficiency of the available resources, when determining protection measures.

As regards habitat types assessed as threatened, the existing legislation does not provide sufficiently effective methods of safeguarding entities beyond the scope of individual habitats. Some of the habitats assessed as most threatened, and entities beyond the scope of individual habitats, will remain outside the scope of the methods currently available for safeguarding biodiversity. The targeting and effectiveness of species protection, and its coordination with the protection of habitats, should be enhanced. Protection of genetic diversity also requires regulation. Likewise, legislation on alien species is deficient. Some offences and violations against the environment are never detected, while some that are detected are never solved. The difficulty involved in criminal investigations of offences and violations against the environment, and in the related evidence gathering, only serves to complicate the issue further.

Measures, responsible bodies and target schedules

Legislation on nature conservation will be developed to respond to the challenges posed by the degradation of biodiversity, while ensuring the full national implementation of EU regulations on nature conservation. Biodiversity is taken into account in steering systems governed by other legislation, particularly in the Forest Act and Environmental Protection Act, the latter of which is currently under reform. In addition, legislative and administrative measures will be revised and developed, while the range of steering instruments will be expanded to rely more on various actors taking responsibility and engaging in voluntary action.

11) Legislation on the conservation and sustainable use of biodiversity will be developed to respond to the challenges posed by the loss of biodiversity, and to ensure the full-scale national implementation of EU regulations on nature conservation.

- Enhance the efficiency, functionality and productivity of nature conservation, by assessing the adequacy of the range of goals and measures provided under the Nature Conservation Act, and by preparing the necessary amendments to the Act.
- Prepare further specifications for nature conservation legislation, to ensure the implementation of EU nature conservation legislation. Expand such a review to cover the protection of genetic resources.

- Take the conservation of biodiversity into account when preparing and reforming legislation that guides the use of natural resources and land areas.
- Examine the possibilities for relaxing the exemption procedures related to the protection of species.

- Ministry of the Environment, other ministries (2013–2020)

12) Examine the possibilities of improving the operational preconditions of the police and prosecutors, with respect to environmental offences.

- Ministry of the Interior (2013–2015)

13) Examine the possibilities for applying ecological compensation proactively, in legislation on land use planning and in business sector projects.

- Ministry of the Environment, Ministry of Transport and Communications, Ministry of Employment and the Economy (2013–2014)

2.2.4.5 Biodiversity in land use planning and land use

Development challenges

At present, it is difficult to take biodiversity perspectives into consideration on a broad scale. For instance, methodologies for taking account of indirect and accumulative impacts on nature are undeveloped and this is often disregarded. The reason is the associated projects are distinct, rendering it impossible to ensure broader-based progress with respect to the same natural area at the landscape level. It is particularly challenging to develop land use planning methods that go beyond the current practice of merely stating conditions towards a more extensive and flexible understanding of biodiversity trends. Correspondingly, in planning, the integration of sustainable use and conservation of biodiversity is a major challenge.

Environmental impact assessment is often solely focused on the occurrence of certain species and habitats in the area under planning. It has not been possible to a sufficient extent to distinguish the structural features of nature, and their natural development, or the significance of observations made on the habitat level, species level and genetic level. On the other hand, biodiversity is highly appreciated by citizens. An interactive approach to impact assessment on the national, regional and local level is necessary in order to include citizens' views, alongside those of experts, in value judgments of nature.

Measures, responsible bodies and target schedules

The aim is to take into account the sustainable use of biodiversity and ecosystem services in land use and project planning. In impact assessment, more attention will be paid to the practical benefits of biodiversity, and to how the project in question influences the realisation of these benefits with respect to different groups of citizens. The principle of sustainable use, which takes account of natural systems, will be applied to impact assessment. This will be particularly so in general land use planning, and otherwise on the plan and programme level, which will enable genuine alternatives and broader areas to be examined.

Account will be taken of biodiversity in both land use and traffic route planning. Planning must be based on sufficient and correctly targeted biodiversity impact assessments, extending to the natural environment outside the area covered by the plan, and to the functioning of ecosystems. Simultaneously, detrimental impacts on biodiversity due to the fragmentation of natural areas must be prevented or reduced, by developing so-called green and blue infrastructure. This will also promote adaptation and resilience to climate change.

14) Study what is meant by green and blue infrastructure (ecological network) under Finnish conditions. Incorporate the formation of an ecological network into land use planning objectives, in order to prevent the fragmentation of continuous natural areas.

- Ministry of the Environment, Ministry of Agriculture and Forestry (2013–2020)

15) Promote the conservation of biodiversity in the planning of land and marine areas and in environmental impact assessments. Ensure that impact assessments of biodiversity are available for decision-makers at the right time. Increase knowledge of marine ecosystems.

- Ministry of the Environment, Ministry of Agriculture and Forestry, Ministry of Transport and Communications, Ministry of Employment and the Economy (2013–2020)

16) Apply the voluntary Akwé: Kon Guidelines, adopted by COP-9 of the Convention, to land use planning and guidance on planning in the Saami Homeland, and take these instructions into account in legislative reforms regarding guidance on land use.

- Ministry of the Environment, Ministry of Agriculture and Forestry, Ministry of Transport and Communications, Ministry of Employment and the Economy, the Saami Parliament (2013–2020)

2.2.4.6 Conservation of biodiversity

2.2.4.6.1 Network of protected areas

Development challenges

COP-10 of the Convention specified the Programme of Work on Protected Areas and requested COPs to invest in the implementation of the programme. In accordance with Decision X/31, by 2015, COPs must integrate protected areas into wider landscapes and seascapes, and with certain livelihoods, in order to prepare for and adapt to climate change, in particular. Key methods of doing so will include the development of ecological networks and corridors, and the restoration and management of degraded habitats. Effective management of protected areas will also be secured by 2012, while ensuring the controlled elimination of alien species from protected areas. The work programme also emphasises the importance of greater, more efficient restoration of protected areas.

The aim of the working programme is to ensure by 2012 the establishment of a representative network of marine protected areas, as well as the launch of appropriate measures for the coordination of the conservation and sustainable use of ecologically important marine areas. Additionally, the coverage, quality, representativeness and connectivity of networks of protected inland waters will be improved.

By 2012, COPs have been urged to prepare and implement sufficient economic plans for the implementation and management of protected areas. Moreover, COPs must evaluate the costs and benefits of protected areas (incl. ecosystem services). COPs are invited to improve the administration of protected areas, their regional participation and the fair sharing of benefits.

Measures, responsible bodies and target schedules

The aim is to establish a comprehensive, efficiently managed, ecologically functional and representative network of protected areas, as a buffer against and means of adapting to the impacts of climate change. Such a network must also maintain ecosystem services and include national and regional systems of protected areas. It must also constitute part of the worldwide network of protected areas, promoted by the Convention.

Completing and strengthening the regional network, and the protection of insufficiently protected habitats, are key tasks in the development of a system of protected areas. An important task for the near future is the implementation of protection measures in line with the protection targets for Natura 2000 areas, in order to achieve and maintain a favourable conservation status. Establishment of protected areas, by issuing regulations on areas allocated for this purpose, is a key component of these measures (see Luonnonsuojelualueiden säädösvalmistelutyöryhmä 2009 — Working group for drafting statutes on protected areas [in Finnish only]). Other required actions include the development of monitoring and planning systems, and the preparation, implementation and maintenance of plans for land management and use. It must also be ensured that account is taken of the measures required in Decision X/31 on protected areas in COP-10 of the Convention, within the implementation of the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity 2012–2020.

Development of a network of protected areas in the action plan period 2012–2020 will be largely based on voluntary conservation. As the number of new protected areas and that of the related, necessary tasks increases, additional resources will be required, either by increasing funding or reallocating resources.

17) Establish state-owned protected areas, covering approximately 700 000 hectares, related to the implementation of national conservation programmes and other areas reserved for protection, and the Natura 2000 network of protected areas. Update regulations on the present network of protected areas.

- Ministry of the Environment (2013–2020)

18) Implement measures in accordance with Decision X/31 on protected areas of the Convention, such as gap analyses and the additional measures required by them.

- Draw up a national development plan on protected areas, through cooperation between administrative sectors and by taking climate change into account. This plan should include an assessment of the connectivity of the network of protected areas, its ecological representativeness and geographical coverage by classification of habitat type, as well as proposals for measures required for the long-term development of the network of protected areas. The Government will decide separately on any measures necessary for covering cover gaps in the network and developing it.

- Implement the conservation objectives for Natura 2000 network areas, in accordance with the EU Habitats Directive by 2020, and regularly assess the status of the network. Land use and management plans will be drawn up for areas where it is required to do so according to the conservation objectives, and these will be implemented and maintained in cooperation with various parties.

- The efficiency and impacts of managing and maintaining the protected area network will be assessed and improved in order to enhance the level of conservation of species and habitat types, and their adaptability to climate change.

- Establish criteria for calculating the percentage of areas protected through conservation and other effective methods for safeguarding biodiversity of Finland's total land area, and inland waters, coastal and marine areas. Additionally, determine this percentage and monitor the implementation of the Convention on Biological Diversity and the Aichi Targets and Finland's biodiversity strategy objective 11.

- Ministry of the Environment, Ministry of Agriculture and Forestry, Ministry of Employment and the Economy (2013–2020)

19) In order to safeguard biodiversity, improve the ecological functioning of the Natura 2000 network and its connectivity as part of more extensive green and blue infrastructure, by means of, for instance, the Nature Conservation Act, land use planning and natural resources planning for state land, and by efficient targeting of agri-environmental support.

- Ministry of the Environment, Ministry of Agriculture and Forestry (2013–2020)

20) Assess the need for implementation of protected areas that have been designated in regional land use plans and municipalities' master plans, but that have not been included in the conservation programmes under the Natura 2000 network, but have been reserved for implementation by the state (SL, SU1). Additionally, assess the order of priority and need for land use and management planning of these areas. Implement the required protection measures.

- Ministry of the Environment (2013–2020)

21) Define the international protected area category of current protected areas, in cooperation with the IUCN and other stakeholders. Examine the need for and possibilities of establishing new types of protected areas, and of creating administrative models for them.

- Ministry of the Environment, IUCN WCPA Finland (2013–2020)

2.2.4.6.2 Threatened habitat types

Development challenges

Changes in habitats constitute a threat to Finnish nature. According to a 2005 estimate by the Finnish Environment Institute (SYKE), coastal areas and forests have seen the most dramatic changes. In the last few years, changes in mires, peatlands and other wetlands have increased, and their importance in adaptation to climate change has grown. Without additional measures, populations of species dependent on these habitats will be reduced and more demanding or specialised species will continue to become threatened.

No full overall picture has been generated of the status and need for conservation of Finland's habitat types, and of the occurrence of several rare types of habitat. Comparability between biodiversity impact assessments created for various purposes is weak, and their quality varies. Moreover, continuous natural development and change, accelerated by climate change, is occurring in the habitats. Biodiversity loss is often related to the human-induced prevention or transformation of natural processes.

Measures for improving the status of threatened habitat types include strengthening current and developing new legislative and administrative procedures, in line with the principle of sectoral responsibility. This will be done by complementing the range of methods available for preserving habitats, nature management and restoration; by developing economic incentive and guidance methods in land use and the use of natural resources; by monitoring trends in the status of threatened habitats and the effectiveness of measures; and by continuing to improve the standard of information on habitat types, and the related information systems.

Particular attention will also be paid to the review and conservation of coherent ecological entities, on the basis of the ecosystem approach. It will therefore be necessary to enhance the effectiveness of landscape-level reviews in land use planning and in planning the use of natural resources, for purposes including the preservation of ecological networks, greater coordination of the identification of threatened habitat types with species protection, utilisation of synergies, and identification of the best possible cost-benefit ratio.

Measures, responsible bodies and target schedules

The objective is to halt the deterioration in the threat status of habitats by 2020, and to use effective measures to improve their status. This requires the preservation and restoration of functional entities related to habitats, even outside protected areas, and the development of guidance methods and incentives for this purpose, through cooperation between various sectors. Achieving a green and blue infrastructure (an ecological network), in order to maintain the conservation status of habitats, requires broad-based shouldering of responsibilities, not only by various administrative sectors but also municipalities, enterprises and other actors.

22) Implement the action plan to improve the status of threatened habitat types, drawn up in cooperation between various administrative sectors and stakeholders.

- Improve the knowledge base used for targeting the conservation, management, restoration, research and monitoring of habitats.
- Increase general knowledge of the importance of habitat types to Finland's biodiversity.
- Add detail to the overall picture of the threatened status of forest habitats.

• Ministry of the Environment, Ministry of Agriculture and Forestry, Ministry of Employment and the Economy, Ministry of Transport and Communications, Ministry of Education and Culture, the Saami Parliament (2013–2020)

2.2.4.6.3 Protection of species

Development challenges

Information on species in Finland and the related changes remains deficient, even if such information is exceptionally comprehensive in international comparisons. The 2010 assessment of threatened species showed that 45–47 per cent of our species were not included in the evaluation processes. Our knowledge continues to be augmented by the research programme for deficiently known and threatened forest species 2009–2016 (PUTTE); well over one half of our species may be included in future evaluations. One of the goals of the Biodiversity and nature conservation segment of the HELCOM Baltic Sea Action Plan is to produce a list of threatened Baltic Sea species and to update the list of habitat types, by 2013. Production of identification guides could improve amateur naturalists' prospects of providing support for the monitoring of species changes.

Finland has not drawn up a national action plan for the protection of flora, but this is being promoted as part of the action plan for species protection, applicable to all organism groups. Correct targeting of protection requires the compilation and updating of up-to-date data on the occurrence of vascular plants, bryophytes, fungi and lichens requiring conservation and monitoring, into information systems used by the environmental administration. Effective exchange of information between various actors is also required. Research is required to enable the correct targeting of management and monitoring; the resulting data will be distributed, for example, through species-specific conservation and monitoring programmes, and instructions for the management of habitats. General monitoring of species and habitats remains unorganised. Enhancing communication and improving the functioning of information systems and the quality of information are also keys to promoting the protection of flora. Similar challenges also apply to our other species.

Protection of species is primarily carried out through the protection and management of habitats. Securing the future of the most threatened species requires individually planned conservation measures in each case. While species-specific conservation programmes are required in approximately 500 cases, for the time being it has proven possible to prepare them for 150 species only. One means of protecting species in need of specific conservation would involve placing them under strict protection, by a decision of the authority in charge of nature conservation, in order to secure the site hosting the species. So far, some 170 such decisions have been made (1998–2000), but more than 1 000 would be necessary. Up-to-date, accurate and more-comprehensive information on the occurrence of threatened species, and advice and instructions on methods of protecting them, are required in order to take account of threatened species in the utilisation of nature outside protected areas. Data contained in the environmental administration's TAXON database, including GIS data on threatened species, remains deficient in many aspects.

Measures, responsible bodies and target schedules

Enhance knowledge and understanding of the status of and trends in species in Finland, and ensure the monitoring of the most threatened species, in particular those placed under protection. At the same time, halt the declining trend in species numbers and counter threats to their habitats, by promoting the protection, management, research and monitoring of species and their habitats, and through communications work in the

field. Implement an action plan for species protection that steers and prioritises current species protection and sustainable use measures, by focusing such measures on key targets. Simultaneously, agree on the division of duties between organisations and prepare a description of the resources required. In addition, research and the compilation of information would enhance knowledge of threatened species, which would facilitate a reliable assessment of the threatened status of most species in our country. Assessing the threat posed to and conservation status of species, during reporting for the Habitats Directive, would serve the monitoring of biodiversity.

23) Improve the standard and accessibility of information on threatened species, for example, when assessing threatened status through species inventories. Enhance exchange of information between actors. Implement an overall assessment of the threatened status of species in Finland, so as to have the following assessment ready by 2020.

- Ministry of the Environment, Ministry of Education and Culture, Ministry of Agriculture and Forestry (2013–2020)

24) In cooperation with other actors, prepare and implement an Action plan for species protection, with schedules, that defines the focus areas, resource targets and prioritisations of actions, and the division of duties between various actors. Launch species protection activities in the correct order of urgency, and harmonise management of the scope of duties, through recommendations and operating instructions.

- Ministry of the Environment, Ministry of Education and Culture, Ministry of Agriculture and Forestry (2013–2015)

25) In forest management, take note of threatened species as specified in the operating model Threatened species in forestry (Uhanalaiset lajit metsätaloudessa 2011). The Finnish Forest Centre and centres for economic development, transport and the environment will put into operation the practices described in the operating model. The power to decide on operating methods lies with the forest owner.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

26) Identify important species hot spots in Finland, which would facilitate the safeguarding of viable populations of several species groups at the same time.

- Ministry of the Environment (2013–2020)

27) Ensure the preservation of species, subspecies and populations such as the Saimaa ringed seal, landlocked Atlantic salmon (*Salmo salar* m. *sebago*) and Arctic char (*Salvelinus alpinus*), and plants in the *Primula nutans* group, which are endemic or almost endemic to Finland. Seek to enhance the viability of these species and groups of species through administrative (regulation of fishing, monitoring and communications) and conservation biology measures; for example, by preparing and implementing population management plans for threatened fish and game species.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

28) Implement approved game population management plans for wolves, bears, lynxes, wild forest reindeer (*Rangifer tarandus fennicus*), Baltic grey seals and grey partridges (*Perdix perdix*), and finalise the management plans under preparation (wolverines, elk and forest grouse species).

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

2.2.4.7 Climate change

Development challenges

The Convention on Biological Diversity (CBD) views climate change as a major threat to biodiversity. Climate change will reduce the diversity of ecosystems (in particular, coral reefs, wetlands, forests, mountains, Arctic regions) and ecosystem services, as well as livelihoods based on these.

The impacts of climate change on Finnish nature must be studied. In addition, at the earliest possible stage, measures necessary for reducing or adapting to detrimental impacts must be anticipated and initiated as necessary. A preliminary assessment has been carried out of the impacts of climate change on biodiversity. Ecologically functioning and adequate networks of protected areas have been proposed as a key measure in promoting adaptation. In changing conditions, improving ecological connections between protected areas, and the interconnections of the protected area network, are considered particularly important. In order to diminish the detrimental impacts of climate change, areas between protected areas (so-called green and blue infrastructure) should facilitate the movement of species on the landscape level, from one protected area to another.

Ecosystems and land use play a key role in the carbon and water cycles, and thus in emissions and carbon sequestration. Preservation of ecosystems in their natural state and the restoration of degraded ecosystems are important both in terms of preserving biodiversity and ecosystem services, and in curbing climate change and adapting to it. Research, based on intercomparable methods, of various ecosystems in their natural state and of modified ecosystems (drained peatlands, farmlands and pastures) should be further increased to identify those important for use as carbon sinks and for carbon sequestration. In Finland, there are excellent possibilities for this due to the high standard of research and the development of models on the carbon balance.

With regard to the adaptation of biota and habitats, it is vital that the other pressures they face, including, for example, fragmentation of habitats, eutrophication, excessive hunting and fishing, are reduced while, at the same time, the restoration of habitats is intensified and climate change is taken into account. In the future, some measures may have to be applied more frequently than now. These include the ex situ conservation and relocation of organisms and their re-introduction to the wild. More study is needed of the benefits and restrictions involved in such methods, and greater preparedness is needed for their implementation.

New research data is required on the impacts of climate change and its progress with regard to the functioning of protected area networks, particularly on waterways, mire ecosystems and wetlands, and the species of northern habitats such as Arctic fells, cold conditions in general, and, for example, dwindling sea ice. We can prepare for change now by carrying out species and ecosystems sensitivity analyses in relation to climate change. The Convention on Biological Diversity has also encouraged the development of rapid assessment methods.

Measures, responsible bodies and target schedules

29) Take biodiversity measures into account when revising the National Strategy for Adaptation to Climate Change (2005). Implement decisions of the CBD and UNFCCC on climate change.

- Ministry of Agriculture and Forestry, Ministry of the Environment, Ministry of Employment and the Economy, Ministry of Finance, other ministries (2013–2020)

30) Basic data on the sensitivity of species and habitat types to the impacts of climate change will be gathered in support of decision-making on protected areas, their management and monitoring. Assess the functionality of the network of protected areas and the need for management of them, as regards adaptation to climate change.

- Ministry of the Environment, Ministry of Agriculture and Forestry, Ministry of Education and Culture (2013–2015)

31) Make preparations for protecting the species most threatened by climate change, outside their natural environments (ex situ). Examine the needs for and possibilities of relocating organisms in response to climate change (i.e. assisted migration).

- Ministry of Education and Culture, Ministry of the Environment, Ministry of Agriculture and Forestry (2013–2020)

32) In line with the CBD's recommendation, identify protected areas and adjacent ecosystems which have the capacity to be restored because of their importance as carbon sinks and for carbon sequestration. On the basis of this information, assess the management of protected areas and the need for restoring adjacent degraded ecosystems, in terms both of biodiversity conservation and carbon sequestration in ecosystems.

- Ministry of the Environment, Ministry of Agriculture and Forestry (2013–2014)

33) Study the impacts of the use of bioenergy and wind power on biodiversity, and take them into account when developing regulations, subsidies and guidelines.

- Ministry of the Environment, Ministry of Employment and the Economy, Ministry of Agriculture and Forestry (2013–2015)

2.2.4.8 Invasive alien species

Development challenges

The Government Programme of Prime Minister Jyrki Katainen defines a policy for preventing the spread of invasive alien species, with the aim of enhancing prevention on the basis of the national strategy for invasive alien species; for example, by improving the possibilities for reporting observations and monitoring. On 15 March 2012, the Government issued a resolution on a national strategy for invasive alien species. The related action plan includes 16 sets of measures for preventing and controlling the impacts of invasive alien species. Such measures include development of legislation on invasive alien species, establishment of an expert and monitoring body, launching communications and training, and establishing a portal on invasive alien species. In addition to these, prevention of invasive alien species requires the creation of advance warning and risk assessment systems in line with the strategy, and the development of research and monitoring. It would also be important to prepare for preventing incursions by new invasive alien species, and for the rapid control of those already introduced. Under the national strategy for invasive alien species, the most extensive project targeting an individual species involves the elimination of hogweed from Finland over the next 10 to 20 years.

Measures, responsible bodies and target schedules

The aim is that by 2020 a system will be in place for controlling problems caused by invasive alien species and preventing any new ones from entering the country. Invasive alien species that have entered Finland can be brought under control and kept at bay through national and international cooperation between authorities. For this purpose, the key routes by which invasive alien species spread must be identified and blocked, and the import of invasive alien species prevented. In addition, possibilities for reporting observations and monitoring must be improved (including the creation of an advance warning system, adequate risk assessment and the establishment of a monitoring and communication system). Implementation of the Government's resolution on a national strategy for invasive alien species (2012) has been initiated. Finland has also signed the International Maritime Organization's (IMO) Convention for the Control and Management of Ships' Ballast Water and Sediments, to prevent the spread of invasive alien species in the ballast waters of vessels. The aim is to ratify the convention as soon as possible.

34) Implement the 16 sets of measures under the national strategy for invasive alien species, and international commitments and other obligations concerning invasive alien species (e.g. IMO, HELCOM, EU).

- Increase research on invasive alien species, on the basis of the national strategy for invasive alien species, particularly by initiating research on the impacts of invasive alien species and the effectiveness and cost-efficiency of the related prevention, so as to enable the correct targeting of measures taken to prevent the detrimental effects of such species.
- Examine the key routes through which invasive alien species enter the country, and measures required for controlling them.

- Ministry of Agriculture and Forestry, Ministry of the Environment, Ministry of Transport and Communications (2013–2020)

2.2.4.9 Nature-based tourism and recreation in natural areas

Development challenges

In Finland too, nature-based tourism is the fastest-growing segment of the tourist industry. The attractiveness of Finnish nature, safety, good transport connections and a high standard of services in national parks combine to provide an excellent basis for the development of nature tourism. However, preservation of natural values and safeguarding the prerequisites of traditional Saami culture livelihoods are basic conditions for developing nature-based tourism in Finland. The growth of tourism should be based on environmental responsibility, the conservation and promotion of the natural environment and cultural attractiveness and biodiversity. At travel destinations, this objective requires the development of routes and natural areas considered key to recreation. Structures, infrastructure and trails built for recreational use in protected areas must be improved using a demand-based approach, while ensuring sustainability of use. Motorised land and water transport will need to be controlled to prevent off-road traffic from posing problems to biodiversity in protected areas. Growth in nature tourism and the recreational use of natural areas will be promoted in a sustainable manner with regard to biodiversity, traditional Saami culture and preservation of employment. This will bring a range of benefits to individuals, society and the natural environment. In the best-case scenario, well-executed and planned nature-based tourism and the development of the related partnerships will serve as an excellent tool for mainstreaming the conservation of biodiversity.

Measures, responsible bodies and target schedules

35) Promote nature-based tourism and the recreational use of natural areas in ways that are sustainable with regard to conserving biodiversity and the Saami culture and traditional livelihoods, in line with the Government resolution on recreation in natural areas and nature-based tourism and Finland's Tourism Strategy to 2020.

- Ministry of the Environment, Ministry of Employment and the Economy, Ministry of Agriculture and Forestry, the Saami Parliament (2013–2020)

36) Update the Off-Road Traffic Act and enhance its enforcement to prevent detrimental impacts on biodiversity.

- Ministry of the Environment, Ministry of Transport and Communications (2013–2015)

37) Enhance land use planning around tourist resorts that is sustainable with regard to biodiversity, for instance, by centralising tourism services with a view to safeguarding biodiversity.

- Ministry of the Environment, Ministry of Employment and the Economy, Ministry of Agriculture and Forestry, the Saami Parliament (2013–2020)

38) Explore ways to maintain citizens' active relationship with the natural world and how to transfer this to new generations. Strengthen the idea of the outdoor activities and recreation as integral to the Finnish identity, and emphasise the positive health impacts derived from the natural environment and its recreational use.

- Ministry of the Environment, Ministry of Education and Culture, Ministry of Social Affairs and Health, Ministry of Agriculture and Forestry (2013–2020)

2.2.4.10 Monitoring, research and data systems

Development challenges

Monitoring

Indicators based on the results of follow-up studies on biodiversity in Finland provide a range of insights into the changes in biodiversity in this country. However, there are gaps in such monitoring. Monitoring of the impacts of climate change on nature and of invasive alien species needs to be planned and implemented without delay. In addition, monitoring of inadequately monitored species (common species) and types of habitat (including Arctic fells, coastal areas, rocks and built environments), and of the most threatened species must be enhanced. Current monitoring of natural resources (such as the national forest inventory) must be developed so as to take account of the status of and changes in biodiversity. Monitoring of farmland biodiversity could be implemented based on a fully developed comprehensive approach in follow-up studies on the impacts of agri-environmental measures (Maatalouden ympäristötuen vaikuttavuuden seurantatutkimus MYTVAS). Indicators describing the status of and changes in ecosystem services must also be developed, alongside biodiversity indicators. With the help of such indicators, the usability of monitoring data could be promoted, for instance, in national, EU and global reporting.

Biodiversity monitoring projects that are coordinated and supported by the environmental administration must be prioritised on the basis of international and national monitoring obligations. Coordination of monitoring must also be developed through a cooperation network of research institutions within the Finnish Partnership for Research on Natural Resources and the Environment (LYNET), the prospective Luonnonvarakeskus (Natural Resources Institute Finland), the Finnish Museum of Natural History and other natural history museums in the country, universities, and Metsähallitus Natural Heritage Services.

Development of monitoring will promote cooperation between various monitoring parties and enhance the usability of monitoring data. Shared databases open to all must be compiled based on monitoring projects, the parties executing them, and the related materials and reports. Simultaneously, more support will be provided for voluntary monitoring work, which plays a key role in Finland in the compiling of observations (up to 70% of labour input). Key issues include coordination and funding of monitoring, prioritisation of subjects, development of methods, motivation of voluntary contributors and securing the continuity of monitoring.

Research

Basic research into conservation ecology and other aspects of biodiversity is scientifically important, as well as being vital to the development of applications in the field. However, the practical application of basic research is challenging, due to fragmented research themes and the preliminary nature of the results. Knowledge of biodiversity in Finland and the factors affecting it must be further increased, while enhancing dialogue, cooperation and information exchange between researchers, authorities, practical actors and users of information. To resolve the comprehensive societal challenges we are facing, we need sociological and multi-disciplinary research into ecosystem services and biodiversity, and the more efficient communication of research data to decision-makers.

Data systems and shared use of data

Recent policy definitions require free access to information generated using public funds. We must ensure not only the high quality of data produced and maintained by various parties, but see to it that key data systems on nature and natural resources are given in a format that allows their joint use and access by everyone in need of information. Access to information should only be restricted insofar as is necessary to protect biodiversity (for instance, the precise locations of threatened species should be kept secret from outsiders, and made accessible only to authorities and the landowner in question). In order to achieve goals for enhancing the national protection of species and cooperation between administrative sectors, the establishment of a virtual Finnish Biodiversity Information Centre is a matter of urgency. The Biodiversity Information Centre would enable integration of the species observation systems of expert amateur naturalist communities into professional systems. This in turn enables the use of species location data collected by amateur naturalists, for example, for purposes of planning the protection of threatened species. Alongside the launch of the Finnish Biodiversity Information Centre, the development of current data systems, such as the environmental administration's TAXON database, is important since these will form part of the centre.

Sharing of biodiversity-related data already existing in Finland (natural history collections and observation data of research institutions, authorities and amateur naturalists' organisations) through the international Global Biodiversity Information Facility (GBIF) will be challenging. The available material covers only 25 per cent of digital data in Finland. Approximately 80 per cent of data shared by Finland originates in the databases of amateur naturalists. All natural history museums in Finland, and parties implementing ecological monitoring, should become GBIF data sources. They should also make available Finland's 30 million or so data records already in digital format. On the other hand, GBIF activities are poorly organised at the national level and have no national funding allocations. The strategic objective of the Global Facility is to strengthen the activities of local biodiversity information facilities. Many member states (such as Australia, Spain, South Africa) have already achieved this, for example, by developing a national biodiversity information facility (BIF), because these countries find that data distributed through the Global Facility, which is available worldwide in English and which serves the international scientific community in particular, does not, in its current form, meet the needs of national administration and education, for instance. A Finnish Biodiversity Information Centre would enable enhanced participation by Finland in both the international GBIF system and a national BIF system. With such a centre, digital biodiversity data could be compiled and shared, in the Global Facility for international use and via a domestic portal for national use.

Information on biodiversity in Finland must be made easily accessible, regardless of where and by whom the data was collected. The Finnish Clearing-House Mechanism of the Convention on Biological Diversity (LUMONET) must be developed into a jointly used portal for the collection and transmission of ecological data, serving the needs of users extensively at home and abroad. This portal should be developed into a window on Finnish nature, through which different parties can access the required data on biodiversity and any related information on the traditional knowledge of the Saami people (Article 8(j)) (incl. Biodiversity.fi; Outdoors.fi; and the search portal of the planned Finnish Biodiversity Information Centre). Proposals for the development of the portal are included in the final report of the project group for the monitoring of biodiversity and data management (SETI) in the Nature conservation productivity project (Luonnonsuojelun tuottavuushanke 2007–2009). The technical implementation of the portal, its location and contents, and its relationship to the corresponding EU system have been agreed upon in principle, but the financing remains unresolved.

Taxonomy

Finland's biodiversity-related information is underused, due to administrative, financial and technical problems. Most of the extensive material in the collections of natural history museums is difficult to use, because it is not fully saved in electronic data systems. A digitisation strategy for natural history museums and an action plan for 2010–2015 were completed in 2009. In 2009–2011, various materials in collections were digitised in a project covering several museums. This scheme was implemented using earmarked funding from the Ministry of Education and Culture, with the support of the National Digital Library, and by means of international funding by foundations. The aim is to convert taxonomic samples into an easy-to-use format, while safeguarding Finland's

taxonomy expertise and enhancing cooperation between parties participating in species knowledge and classification, and other species research. The Finnish Museum of Natural History is also compiling species checklists that contain information necessary, among other things, to assessing threatened species in Finland and their conservation status.

The connection between natural history collections and universities is important for the purposes of, among other things, education of researchers and the joint use of research facilities. In Finland, the lack of trained taxonomists and museum professionals specialised in processing species data complicates issues, such as the monitoring and assessment of changes in species. Taxonomic research of a number of invertebrates, algae and fungi has progressed slowly. On the other hand, knowledge of species in Finland has made significant progress, thanks to funding targeted at research into deficiently known and threatened forest species (PUTTE), carried out under the METSO programme (2003–2012) and constituting the largest appropriation allocated to taxonomic research in Finland (some 1.7 million euros, funding more than 50 studies).

A natural partner of the Finnish Museum of Natural History and other museums of natural history is the Finnish Environment Institute (SYKE). The division of duties between institutions should be developed further, for example, with respect to joint research objectives and the exchange of data materials. In cooperation with various administrative sectors, the University of Helsinki is examining different ways of supporting the Finnish Museum of Natural History, so as to enable it to serve even information and infrastructure needs related to species protection.

Measures, responsible bodies and target schedules

39) Identify and assess the status of ecosystems and ecosystem services in Finland, in line with the EU biodiversity strategy.

- Ministry of the Environment, Ministry of Agriculture and Forestry (2013–2014)

40) Enhance the joint use of research and monitoring data between parties engaged in biodiversity research and monitoring (e.g. LYNET institutions, the planned Luonnonvarakeskus [Natural Resources Institute Finland]) and users of data (e.g. authorities, land use planners, landowners). Establish a virtual information system (Finnish Biodiversity Information Centre) for the collection of species data that is now dispersed between various organisations, in order to digitise and facilitate the joint use of such data. Update and implement development proposals concerning the LUMONET portal, in order to develop it into a national channel for collecting and transmitting biodiversity-related data to a broad base of users (incl. researchers, decision-makers, media, landowners, amateur naturalists), while taking into account the conditions laid down in the Personal Data Act (Henkilötietolaki).

- Ministry of the Environment, Ministry of Agriculture and Forestry, Ministry of Employment and the Economy, Ministry of Education and Culture, the Saami Parliament (2013–2020)

41) Initiate the research programme, included in the Government Programme, aimed at assessing the financial impact of biodiversity and ecosystem services, as part of the green economy research entity.

- Ministry of the Environment, Ministry of Agriculture and Forestry, Ministry of Employment and the Economy, Ministry of Education and Culture (2013–2015)

42) Clarify cooperation and the division of duties between the Finnish Museum of Natural History and the Finnish Environment Institute in basic taxonomic research, the production and storage of sample material and the monitoring of biodiversity, taking account of the development of state sectoral research institutions and of tasks performed under the regulations governing organisations.

- Ministry of Education and Culture, Ministry of the Environment (2013–2014)

43) Continue the digitisation of the Finnish Museum of Natural History's taxonomic data and of key materials of regional museums and collections, and the production of checklists promoting the conservation of species. Operators will agree between themselves on the updating of species checklists, resources and digital exchange. Enhance the joint use of datasets on the Internet, by promoting the implementation of the objectives of the Global Biodiversity Information Facility (GBIF) in Finland.

- Ministry of Education and Culture, Ministry of the Environment (2013–2020)

44) Continue the Research Programme of Deficiently Known and Threatened Forest Species (PUTTE). Compile identification guides on Finland's key groups of species. Engage in cooperation related to species, knowledge of them and their classification with, among others, Sweden's Svenska artprojektet project.

- Ministry of the Environment, Ministry of Education and Culture (2013–2020)

2.2.5 Challenges and measures regarding habitats and natural resources

2.2.5.1 Forests

Development challenges

The objective of Finland's National Forest Programme 2015, which was revised in 2010 and adopted in a Government Resolution, is to develop the forest sector into a biocluster that also produces materials and services on an extensive basis for various sectors. The aim is to generate increased welfare through diverse and sustainable forest management. The objectives of the programme include strengthening forest-based business and increasing the value of production, improving the profitability of forestry and strengthening forest biodiversity, environmental benefits, and welfare implications. In terms of biodiversity, the aim is to halt the decline of forest habitat types and species, and to establish a favourable trend in the state of biodiversity.

To safeguard forest biodiversity in Southern Finland, the Government adopted in 2008 the Forest Biodiversity Programme for Southern Finland (METSO). This programme aims to halt the decline in forest species and habitats, and to establish favourable trends in forest biodiversity by 2016. The Programme of the Finnish Government (2011) includes the decision to continue the METSO programme until 2020. The Ministry of the Environment and the Ministry of Agriculture and Forestry are responsible for the implementation of METSO.

METSO is an action plan comprising 14 points. The measures listed can be divided into four themes:

- Improving Finland's network of protected areas
- Nature management in commercially managed forests
- Developing impact assessment and the measuring of results
- Collaboration between forest and environmental organisations, advice to forest owners, training of professional foresters, and communication

Although forest biodiversity is no longer declining as rapidly as before, there has been no halt in the overall trend. When assessed on the basis of genuine changes in species conservation status (excl. increasing knowledge, changes in criteria), forest species are still subject to more negative than positive changes. However, the status of forests is the best among all habitat types. Positive results have been achieved in commercially managed forests by enhanced protection and the application of nature management methods. It should also be mentioned that some species have adapted to the changes resulting from forestry, while others have even benefited from them.

Measures, responsible bodies and target schedules

To achieve and maintain a favourable conservation status for forest species and habitats, long-term systematic development efforts and cooperation between various parties are required. The network of protected areas also

needs to be developed, in order to enhance the representativeness and connectivity of protected forests in Southern Finland. The aim is to halt the declining trend in forest species and the mounting threat posed to habitat types, by combining methods, such as a regionally comprehensive network of protected areas and the application of nature management methods, in commercially managed forests.

According to the Programme of the Finnish Government, the economic base of forestry and the forest industry was reformed through the overhaul of forest legislation. The new Forest Act came into force at the beginning of 2014. It makes possible to safeguard biodiversity and its multiple use, and the interests of the national economy, wood users and forest owners.

45) Implement the measures included in the Forest Biodiversity Programme for Southern Finland (METSO) and secure funding for the METSO programme, in accordance with the Government Programme. Finalise the interim assessment of METSO and revise the METSO programme insofar as necessary.

- Ministry of the Environment, Ministry of Agriculture and Forestry (2013–2020)

46) Implement measures included in the National Forest Programme 2015 (NFP), and evaluate and revise the programme insofar as necessary.

- Diversifying forest management methods to support the increasingly varied uses of forests by revising statutes, forest management recommendations, forest management planning, and associated advisory services and training.

- Improving habitat management in commercial forests by revising the associated financing systems, forest management recommendations, and guidelines, and by providing training to forest owners and actors

- Allocate environmental support denoted in the Act on the Financing of Sustainable Forestry effectively with respect to safeguarding biodiversity.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

47) Develop and test regional cooperation models suitable for privately-owned forests, for instance, through METSO cooperation network projects. Take the special characteristics of private forests into account in planning.

- Ministry of Agriculture and Forestry (2015–2020)

48) Safeguard and take biodiversity and ecosystem services into account in state-owned, commercially managed forests, in accordance with the environmental guide of Metsähallitus.

- Ministry of Agriculture and Forestry (2013–2020)

49) Pay attention to biodiversity values and the ecosystem services of state-owned recreational areas and research forests, for instance, in connection with the METSO programme.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2015)

2.2.5.2. Mires

Development challenges

Although the loss of the mire habitat area has slowed since new drainage become less common, many land use pressures still threaten the natural state of the remaining mires. Peat extraction is among the most severe of these threats. At present, environmental permit procedures on peat extraction are pending for dozens of mires, primarily ones where no artificial drainage ditches are in place. With regard to these, the Ministry of the Environment and peat producers are negotiating on bringing mires (purchased for peat production purposes, but

involving significant natural values) under state ownership for nature conservation reasons. Future threats to mires also include ditch cleaning and supplementary ditching to make mires more productive for forestry purposes. In such cases, the drainage impact may extend to mires with no artificial drainage ditches. Among other factors, the felling of timber in mires with no artificial drainage ditches, and the preparation of soil, clearance of agricultural land, groundwater abstraction and construction of roads may still affect biodiversity in mire ecosystems. Climate change endangers peat mires in particular, because ground frost-related phenomena are crucial to their preservation.

The Government passed a resolution on 30 August 2012 on the sustainable and responsible use and conservation of mires and peatlands (Valtioneuvosto 2012a). Policy definitions in the resolution are based on the proposal for a national strategy for the sustainable and responsible use and conservation of mires and peatlands, submitted to the Ministry of Agriculture and Forestry on 16 February 2011. The policy definitions of this resolution reconcile the use and conservation of mires and peatlands by directing activities which would cause considerable change to the mires towards sites which have been drained, or whose natural state has otherwise already undergone significant changes. This is done by implementing sector-specific strategies and measures relating to sustainable and responsible use, and by enhancing the representativeness and ecological functionality of the network of protected mires.

There is a need for an overall assessment of how various measures might contribute to enhancing the preservation of the ecological network of mires and improving the state of mires, and to promoting the sustainable use of natural resources located in mires. One of the key objectives of the proposal for a national strategy for the sustainable and responsible use of mires and peatlands (Valtioneuvosto 2012b) is to halt biodiversity loss in mires, to improve the state of mire ecosystems (mire complex types, mire types, species) and to establish a trend aiming at favourable conservation status. Measures undertaken to achieve this include, on the one hand, enhancing the representativeness and state of the network of protected mires, and, on the other, planning the allocation of uses that involve changes. The strategy includes a large number of proposals for enhancing the sustainable use of mires. A substantial proportion involves measures and projects or methods already in use. Enhancing their efficiency is considered vital. Means must be found for focusing new land use, which would entail considerable changes to mires, in mires and peatlands which have already been drained or whose natural state has otherwise been significantly changed. A key role in this respect is played by the selection of locations for peat extraction, ditch cleaning and supplementary ditching to make mires more productive for forestry purposes, and clearance of agricultural land in particular.

Measures to ensure the water balance of protected mires include restoration of drained mires, inspection of boundary lines and improving the water balance of the protected area, even in the planning and implementation of land use outside the protected area (such as ditch cleaning and supplementary ditching to render mires more productive for forestry purposes). To the south of Forest Lapland in Finland, protection of mire ecosystems is hampered by regional shortcomings and deficiencies in mire categorisation. The Ministry of the Environment has appointed a working group to prepare a conservation programme in line with the Nature Conservation Act (Complementary mire protection programme). By the end of 2014, this group will seek to define mires with natural values of national importance, and to prepare a proposal for the selection and definition of targets. A conservation programme in line with the Nature Conservation Act is achieving part of the Government resolution's objective of improving the state of mire ecosystems. Other measures aimed at the same goal include enhancing the efficiency of the METSO programme in the conservation of forested mires, and the development of voluntary conservation methods in line with the METSO model for open mires. Promoting the statutory conservation of habitat types and efficiently implementing land use planning and national land use guidelines also number among such measures.

Account should also be taken of the impacts of obligations and measures compliant with various laws on the use of mires and conservation of mire ecosystems. This issue is related in particular to legislative reform of the Nature Conservation Act, Forest Act and Environmental Protection Act, and to the implementation of water resources management legislation, the Water Act and water resources management action plans. In addition, account should be taken of the implementation of forest management recommendations, the implementation of forest

planning and certification (incl. the directing of new land use, which involves considerable changes in mire ecosystems, to mires which have been drained, or whose natural state has been otherwise significantly changed) in both private- and state-owned areas.

Restoration of mires where the natural state has been considerably degraded, but which are still considered most valuable in terms of nature conservation, is vital in terms of safeguarding the biodiversity of mire ecosystems. Although restoration has so far only been carried out in protected areas, restoration of drained mire areas that are unprofitable to forestry, but which are linked to areas of natural mire habitat with no artificial drainage ditches of major natural value, would improve the natural state, overall ecology and functioning of these mire areas. This would also help to stabilise the state of mire species, while safeguarding the role of peat in mires as carbon sinks, and in the long term, would improve the quality of runoff waters. Experimentation and reinforcement of the knowledge base is still required for planning and implementation of the restoration of wooded mires and fens, few of which are protected. Adequate monitoring of the cost-efficient technical implementation of restoration, and the related ecological effectiveness and impacts, is also proving to be a challenge.

Measures, responsible bodies and target schedules

The aim is to safeguard the biodiversity and ecosystems of mire habitats and species, and to foster the stabilisation and strengthening of populations of threatened species.

50) Implement the Government resolution on the sustainable and responsible use and conservation of mires and peatlands. By the end of 2014, assess the impacts of the resolution and any further measures required.

- Ministry of Agriculture and Forestry, Ministry of the Environment, Ministry of Employment and the Economy (2013–2020)

51) In order to sustain the natural water balance that maintains mire ecosystems which are already protected, revise the ecological definitions of such ecosystems, for instance, by applying voluntary conservation methods such as the METSO programme.

- Ministry of the Environment, Ministry of Agriculture and Forestry (2013–2020)

52) Direct new land use, which would cause considerable changes to mires, to mires and peatlands that have already been drained or whose natural state has otherwise been significantly changed.

- Ministry of the Environment, Ministry of Agriculture and Forestry, Ministry of Employment and the Economy (2013–2020)

2.2.5.3 Wetlands

Development challenges

Wetlands face various pressures. In eutrophic waterfowl habitats, invasion by aquatic plants is the major factor causing changes. This process reduces the area of open water and the mosaic of tuft and water surfaces in flood meadows — flood meadows dry up and willow thickets and birch stands become increasingly dense. In sea bays that are rich in nutrients, algae blooms occur, turning waters increasingly turbid and reducing the volumes of floating-leaf water plants and submerged plants. In most sea bays and along shallow shores, the dominant species is the common reed, driving out other vegetation from the areas. Water-level fluctuations, ice and currents keep water areas open and curb vegetation, but in most cases, more elevated flood meadows are overgrown with reeds and bushes. These changes have led to both the qualitative and quantitative impoverishment of wetland species. Eutrophication of waterbodies has produced and continues to produce new wetlands. Here, the

challenge lies in monitoring this situation while also pursuing the completion of the Waterfowl Habitats Conservation Programme.

The state of wetlands has clearly declined in the last 30 years. The 2008 assessment of threatened habitat types in Finland revealed that 80 per cent of semi-natural wetland biotopes, and approximately one half of wetland habitats of the Baltic Sea coast and inland areas, are threatened. Correspondingly, the latest assessment of endangered species (2010) indicates that one quarter of wetland bird species are threatened. Recently, populations of common waterfowl nesting in wetlands, such as the wigeon (*Anas penelope*), the northern pintail (*Anas acuta*), the garganey (*Anas querquedula*), the tufted duck (*Aythya fuligula*) and the pochard (*Aythya ferina*), have been in intense decline. This has been particularly true in eutrophic, rather than oligotrophic, waters. In our internationally valuable wetlands (IBA areas), the conservation point value of avifauna has declined by 1.9 per cent a year since the 1960s. Basic remedial action in localities has succeeded in slowing the decline in conservation value, to 0.6 per cent a year only, whereas unmaintained or low maintenance localities have seen a decline of 2.2 per cent a year.

According to an estimate by the Finnish Environment Institute (SYKE), 163 areas listed in the Waterfowl Habitats Conservation Programme require urgent remedial action. In 2007, the remediation plan had been, or was being, implemented in 62 areas out of the aforementioned 163. Moreover, a remediation plan was completed or being planned for 30 areas, whereas 71 areas still lacked a plan. In addition, 32 conservation plans are being prepared for the management of the habitats of the southern dunlin (*Calidris alpina schinzii*) and for the remediation of areas suitable for this species. The areas included in the Waterfowl Habitats Conservation Programme cover only a few shore areas with herb-rich forest, typical of waterfowl wetlands, among the wooded mires and wooded flood meadows considered integral to the ecotones of vegetation in wetlands. In many cases, narrow definitions of protected areas impede remedial and management action.

The State is the major source of funding for remedial action in waterbodies. Every year, 2–3 million euros are channelled into remedial action via the Ministry of the Environment and Ministry of Agriculture and Forestry. Remediation is also carried out, for example, by the centres for economic development, transport and the environment, with employment funds. However, wetlands are still conceived too sector-specifically. Wetlands built to reduce discharges from agriculture and forestry into water also provide benefits for birds and other biodiversity conservation. It would be important to enhance cooperation between various parties, and to prioritise targets of remedial action on the basis of nature conservation and biodiversity values, in order to facilitate the conservation of wetlands. Extensive areas should be selected as targets of remedial action, and such action must take account of the entire catchment basin.

Although the conservation of wetlands has progressed in recent years, conservation targets remain partly unspecified. Wetlands are also important to hunting. Studies indicate that the use of wetlands could be improved by regulating hunting according to game management considerations, both regionally and time-wise in particularly important conservation areas for wild birds. It is vital to safeguard the natural dynamics of wetland bird populations and the autumn staging areas of migratory waterfowl much more widely than today, by reducing disturbances. Such restrictions would not be executed through unilateral decisions by authorities, but implemented in important hunting areas by reconciling the objectives of the various interested parties.

A new challenge lies in the objective of Finland's game husbandry wetland strategy (2011) to manage existing wetlands and establish new ones. This strategy emphasises hunters' and landowners' possibilities of enriching wetland ecosystems through voluntary measures. Effective communications are the key to implementing such projects, because they systematically guide active voluntary work by hunters and landowners, and their practical game management expertise, towards the remediation of small-scale wetland habitats. This would particularly benefit the habitats of game birds dependent on wetlands, which, in turn, would benefit biodiversity on a broader scale. To enhance the diversity of wetland ecosystems, former peat production areas could be restored into wetlands.

An action plan will be drawn up for halting the degradation of and improving the conservation value of wetlands. Its measures can be divided into four interlinking themes:

- Improving Finland's network of protected areas.
- Continuing and enhancing the application of nature management methods in wetlands.
- Improving the knowledge base, in order to facilitate the assessment and development of measures.
- Cooperation between agricultural, game and environmental organisations, the provision of advisory services to landowners, the training of water resource management professionals and communication with all of these parties.

Measures, responsible bodies and target schedules

The aim is to safeguard the biodiversity of wetlands and waterfowl habitats and species, and to stabilise and strengthen populations of threatened species.

53) Develop and implement an action plan for wetlands in Finland.

- Prepare an extensive wetland Life project 2014–2019.
- Restore other areas included in the Waterfowl Habitats Conservation Programme, in accordance with the agreed order of priority, maintain the results achieved and monitor the impacts of remedial action. Restore former peat fields into wetlands, restore former wetlands and create new ones.
- Implement the decisions of Ramsar, the international Convention on Wetlands of International Importance, especially with respect to waterfowl habitats and the objectives of the strategic plan (2009–2015). This will be done by establishing a national working group for wetlands, completing the list of Ramsar sites, updating the required inventory data, enhancing surveys of ecosystem services and the guidance on the management and use of such services, and enhancing communications (Ramsar Convention's Communication, Education, Participation and Awareness Programme [CEPA]).
- Examine the possibility of phasing in the start of hunting seasons, by time and location in ways that benefit both game management and biodiversity.
- In cooperation with landowners, specify methods of waterfowl habitat conservation so as to enable landowners to promote the conservation of waterfowl habitats based on the greatest possible ecological diversity, and to enhance the sustainable use of game waterfowl populations.

- Ministry of the Environment, Ministry of Employment and the Economy, Ministry of Agriculture and Forestry (2013–2020)

54) Implement a national wetland strategy for game husbandry for Finland. Continue systems providing subsidies for wetlands.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

2.2.5.4 Agricultural environments and semi-natural habitats

Development challenges

In the last decade, the number of farms has declined drastically in Finland, while their size has correspondingly increased. In particular, while the number of livestock farms has declined, livestock numbers on farms where production is continuing have increased and the number of grazing animals has fallen. Farms have specialised their production, and production has been specialised regionally and geographically. In turn, this has resulted in less-diverse habitats and landscapes. Economic changes in product prices and the terms of agricultural subsidies have decreased the significance of crop yield volumes to farmers' income. Agricultural subsidies are falling, with a declining trend in prospect. Land in good growth condition is a prerequisite for cost-efficient food production that makes sparing use of agricultural land, resulting in the freeing up of land, such as wide verges, for biodiversity

purposes. Investments in good harvests are also important to curbing climate change: these enable farmers to focus on food production, while the forests they own can continue serving as carbon sinks.

Many species of flora, insects, birds and mammals are directly dependent on habitats formed by agriculture. Declining numbers of grazing animals, overgrowth of uncultivated fields, the declining area of verges and regression in the management of agricultural heritage habitats, have undermined the previously rich biodiversity of these environments. Increasing underground drainage has resulted in fewer open ditches and verges in farmland habitats since the 1950s. Verges are important routes for many animal species. Alongside buffer zones, more than 65 000 kilometres of verges have been established with the help of agri-environmental support.

Overgrowth of meadows and eutrophication are the reasons behind the declining numbers of key pollinating insects, such as butterflies and bees. The most valuable habitats for birds include green fallows, pastures, meadows and grasslands. Traditional farm habitats and wooded pastures also provide nesting sites and places of refuge, as well as sources of nutrition, for birds.

Management of semi-natural habitats in farmland has benefited from the agri-environmental scheme. However, since this system is primarily targeted at active farmers, certain semi-natural habitats have been excluded and are not being managed. Agri-environmental support in the programming period 2007–2013 expanded the range of beneficiaries in the management of semi-natural habitats and establishment of wetlands, by creating multiple functions, from farmers to registered associations, and thereby offering new opportunities for safeguarding biodiversity.

The preservation of semi-natural habitats requires either grazing or other active management. But the number of such habitats covered by management agreements will not suffice to preserve the species, ecological variation or regional special features characteristic of these agricultural environments. Another factor impeding the remediation and management of semi-natural habitats on farms lies in the declining presence of grazing animals on farms, while farms engaged in expanding production and enhancing their efficiency cannot spare the time to manage such sites. Furthermore, changes in land use are rapidly rendering information on valuable natural sites obsolete.

Measures, responsible bodies and target schedules

Conservation and management of biodiversity in agricultural environments remain among the focus areas of diversified agriculture. Attention will also be paid to securing continuity in the management of semi-natural habitats and the species of fauna and flora dependent on them. Alongside this, the declining trend in the biodiversity of ordinary agricultural environments will be halted and such action will be prioritised as a goal. The significance of agricultural environments to other ecosystems will be taken into account in the planning of cultivation. Economic incentives, including agri-environmental subsidies, must be reformed in order to better enable them to secure sufficiently wide-ranging management of valuable semi-natural habitats. In addition, sites suitable for remediation and restoration are required. Their purposeful management may help restore original natural values. Up-to-date information on the preservation of sites is also needed, to facilitate the targeting of management efforts.

55) Policies and strategies promoting biodiversity, and measures promoting and conserving biodiversity, will be further developed in agricultural practices, for example, through targeting of the agricultural subsidy scheme. The need for food and biomaterials will be safeguarded through management of productive agricultural land. This will free up land for managing biodiversity and water resources protection in fringe areas. Simultaneously, contract models will be developed in order to safeguard ecosystem services, for example, for the maintenance of landscape and water resources.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2014)

56) Update data on valuable semi-natural habitats and their management requirements.

- Ministry of the Environment, Ministry of Agriculture and Forestry (2013–2018)

57) Promote the management of landscape and biodiversity in connection with active agriculture, by enhancing advisory services, education, training and research and cooperation between various actors. Support the preparation of general plans for wetlands, buffer zones and biodiversity.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

58) Safeguard the conservation of habitats and protection of routes of species dependent on agricultural environments, through environmental measures in agriculture.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

59) Secure continuity in the management of semi-natural habitats and other agricultural areas of high natural value, by reforming agri-environmental support for the programming period 2014–2020 and by increasing the number of semi-natural habitats being managed. In addition, develop other support measures outside agricultural policy, in order to maintain and boost the effective management of semi-natural habitats in protected areas and other areas outside farms.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

2.2.5.5 Substitute habitats

Development challenges

In naturally open habitats and in semi-natural habitats, natural values cannot be safeguarded through conservation alone, unless continuity of management can be ensured. In terms of management, sites outside farms in so-called substitute habitats are most problematic, as no system has been established to ensure their remediation and management in every respect. These substitute habitats have appeared as a consequence of anthropogenic activity — the parties responsible for their management and maintenance are not always aware of their significance to maintaining biodiversity. Such sites are therefore often destroyed inadvertently. On the other hand, regular management (mowing) of roadsides has shaped them into substitute habitats, where even threatened species may occur. Separate measures, and knowledge of measures suitable for the restoration of these habitats, as well as the restoration or imitation of natural processes, are required in the management of substitute habitats.

Measures, responsible bodies and target schedules

The aim is to halt the decline of threatened open habitat types and the habitats that partly replace them, and of substitute habitats and their species. We must also improve the status of species and intervene in the causes of the decline. Through the management and remediation of semi-natural habitats, and other open habitat types and supplementary substitute habitats, a functional regional network will be created that facilitates the movement of species from one area to another and their expansion into new areas, as the measures to manage or restore such areas make them suitable for the species in question. The safeguarding of natural values along transport routes, such as roadsides (regional management contracts), will be reconciled with ensuring the safety and flow of traffic, and with other prevailing conditions.

60) Identify the existing substitute habitats considered valuable in terms of biodiversity (e.g. road verges, railway lines and sidings, open areas around power lines and waste land), and determine the number of substitute habitats that are becoming more common (e.g. green roofs) and their significance to biodiversity. Investigate the possibilities of managing and funding such habitats at regional and local levels.

- Ministry of Transport and Communications, Ministry of Employment and the Economy, Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

61) Convert decommissioned mineral extraction sites into substitute habitats that play a key role in conserving biodiversity. For instance, species of sunlit habitats may thrive in such sites.

- Ministry of Transport and Communications, Ministry of Employment and the Economy, Ministry of the Environment (2013–2020)

2.2.5.6 Geological formations and biodiversity

Development challenges

Finland's Land Extraction Act aims at the extraction of mineral resources in a manner that supports environmentally sustainable development. Meeting this objective requires information on the natural values of geological formations, groundwater conditions, and on the quantity, quality and consumption of exploitable mineral aggregate.

Gravel and sand have become less readily available, particularly in the environs of large growth centres. Correspondingly, the volume of rock aggregate used has increased. The need to reconcile mineral aggregate supply with other forms of land use, such as infrastructure construction and protection (incl. the protection of groundwater areas) is increasingly emphasised in the utilisation of mineral aggregate. In order to safeguard biodiversity, permit procedures in accordance with the Land Extraction Act, and enhancing the efficiency of regional planning in support of the terms of the Act, are required in order to reconcile the use of mineral aggregate and other forms of land use. In doing so, account must be taken of the utilisation of gravel and sand resources in sea areas.

Business activity in the mining sector has picked up dramatically in Finland, due to a variety of factors. These include increasing demand for basic metals, liberalisation of markets, and more efficient ore prospecting. Other contributing factors include Finland's diverse and well-known mineral resources, and high ore potential. Supranational mining companies seek to establish business in areas with the best estimated possibilities for success, evaluated on the basis of geological and various socio-economic factors. International evaluations rank Finland as one of the foremost target countries for mining operations. At present, mining is intensively focused on Eastern and Northern Finland.

The Mining Act of 1965 has been completely revised and the new Mining Act entered into force in July 2011. The mining duties was transferred from the Ministry of Employment and the Economy to the Finnish Safety and Chemicals Agency (Tukes), with certain exceptions. The objective of the new Act is to safeguard mining and ore prospecting in a socially, economically and ecologically sustainable manner. Under the Act, permit consideration is based on a comprehensive survey, taking account not only of the requirements of ore prospecting and mining, but also other factors such as the environmental impacts of operations, impacts on the landscape, land use and safety (incl. sparing use of natural resources, nature conservation and the reconciliation of the different needs for use of areas). Additionally, possible restrictions in other legislation, such as the Nature Conservation Act, should be taken into account when granting permits. Environmental permits for mining are determined under a permit procedure in accordance with the Environmental Protection Act.

Measures, responsible bodies and target schedules

The need to reconcile infrastructure construction with conservation is emphasised in the conservation of geological formations valuable to biodiversity. Extraction of mineral resources in a manner that supports sustainable development and biodiversity requires basic knowledge of the quantity, quality and consumption of groundwater and mineral aggregates, alongside environmental conditions and natural values. Ecologically

sustainable use of mineral resources is aimed at reducing the use of virgin mineral aggregate resources. The effectiveness of permit procedures implemented in line with the Land Extraction Act in the conservation of biodiversity depends on how well the natural and landscape values of areas are known.

The new Mining Act established the Finnish Safety and Chemicals Agency (Tukes) as Finland's new mining authority. Tukes decides on permits for ore prospecting, mining and gold panning; grants mining safety permits; supervises ore prospecting, mining and gold panning; manages the permit-related information service and maintains the mining information register. In the initial stages, there have been severe delays in the consideration of permits by the new mining authority. For Tukes, the key near-term challenge lies in building trust and partnerships with stakeholders, and in recruiting new human resources.

62) Develop legislation governing the use of land and sea areas, and planning and research, in support of the sustainable use of mineral resources. In line with Finland's Baltic Sea Action Plan, prepare a plan on the extraction of sea sand and mineral resources covering Finland's coastal areas, in order to limit any harm caused by such activity. Examine the relation between the Land Extraction Act and Mining Act with respect to threatened rocky habitats.

- Ministry of the Environment (2013–2020)

63) Finalise inventories of geological formations and ensure the easy availability of inventory data for use by authorities, planners and parties extracting materials. Complete and maintain the mineral resource accounting system, in line with the objectives for the sustainable use of materials. Complete and update the material of the project for the reconciliation of groundwater conservation and mineral material supply (POSKI) as regards natural values, to assist in land use planning.

- Ministry of the Environment, Ministry of Employment and the Economy (2013–2020)

2.2.5.7 Lakes, rivers and other inland waters

Development challenges

Relatively little is known about the biodiversity of inland aquatic environments, both as regards species and habitat types. The gaps in our knowledge are particularly huge with regard to underwater environments. Very few small water bodies remain in their natural state. Although attention has been paid to their conservation, for example, in the Water Act and Forest Act, as well as in forest management instructions and recommendations, they are often in a poor state. Further measures should be taken to protect them.

Most rivers are in a satisfactory or poor state. In many localities, old dam structures present obstacles in rivers and streams to the passage of fish and transfer of sludge. Poor water quality in coastal rivers and the prevention of fish migration by power plants and other obstructions are the factors most detrimental to migrant fish. Acidification and metals still constitute a major regional problem in rivers and streams in Ostrobothnia. These can result in fish deaths and can cause changes in the structures of biotic communities.

Restoration of rivers and streams, and remediation of habitats, bring ecosystems in rivers and streams closer to their natural state, while reintroducing threatened species to river and stream habitats that have been changed. This revives threatened and declining migrant fish stocks and other ecosystems in rivers and streams.

Point-source pollution in inland waters has decreased. However, a decrease in the volumes of diffuse pollution, particularly from agriculture and forestry, is still a difficult challenge because of the increase in winter precipitation due to climate change. Loads caused by peat production on inland waters also lead to oxygen depletion, eutrophication and changes in water ecosystems. In many lake regions, prime shores for secondary residences are already built up. New coastal properties are located on shores less suitable for recreational use, thus increasing the need for dredging.

There is a great need for information on the environmental impacts of livelihoods that utilise natural resources. Investments should be made in the objective assessment of environmental impacts, particularly as concerns inland waters, in order to guide economic activity to generate the expected environmental impacts, and to justify the introduction of new technologies and restrictions.

Measures, responsible bodies and target schedules

The River Basin Management Plans, adopted by the Government, and Programme of measures as well as Programme for Implementation of River Basin Management Plans 2010–2015, will also promote the conservation of biodiversity and the pursuit of sustainable use objectives. During the revision of water resources management and action plans, particular attention will be paid to the objectives of conserving biodiversity and sustainable use. Water resources management measures will reduce the pressures on waters, in particular, nutrient and detrimental substance loads. The indirect and direct impacts of measures on the aquatic environment will be minimised during hydrological (or environmental) engineering and in regulation of waterways. The biodiversity of the aquatic environment will be restored through remediation and restoration actions, and by preventing the spread of invasive alien species and their detrimental impacts in aquatic ecosystems. At the same time, the biodiversity of wetland habitats, the aquatic environment and underwater habitats and species will be safeguarded, while actions will be taken to promote the establishment and strengthening of threatened species populations.

64) The starting point for reforming the agri-environmental scheme will be the national and EU-level objectives for the conservation of aquatic environments and other biodiversity. Subsidies will be allocated to the most efficient measures and to the areas with the highest loads.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2014)

65) Continue to reduce the detrimental impacts from the regulation of water and developing practices for the release of water in cooperation with permit holders, municipalities and other key actors. Continue the removal of fish to reduce nutrient loads in aquatic ecosystems and to prevent eutrophication.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

66) Implement regional water resources management plans and action plans, and the National Programme for the Implementation of River Basin Management Plans for inland and coastal waters, including quantitative objectives.

- In connection with the revision of water resources management plans and action plans for the following water resources management period, particular attention will be paid to the objectives of conserving biodiversity and sustainable use.
- Initiate restoration projects to promote biodiversity in water bodies, in accordance with the water resources restoration strategy.
- Prepare and initiate a restoration strategy and programme for small water bodies, as part of the national plan for the implementation of water resources management.
- Assess the biodiversity of inland water ecosystems, particularly as concerns underwater habitats and species.
- Improve cooperation between water resources and nature conservation sectors, and enhance research into water resources management, with emphasis on the catchment basin as a whole.

- Ministry of the Environment, Ministry of Agriculture and Forestry (2013–2020)

67) Reduce the degradation of ecosystem services due to business operations, such as peat production and mining, for example, by reducing environmental impacts detrimental to nature and recreational use, and to traditional Saami livelihoods, particularly where discharges into water and other emissions are involved, by

enhancing the effectiveness of the sector's own environmental protection measures, implemented using the best available technology.

- Ministry of Employment and the Economy, Ministry of the Environment (2013–2020)

2.2.5.8 Baltic Sea and shores

Development challenges

The programme of work on marine and coastal biodiversity (2004) under the Convention on Biological Diversity seeks to promote the integrated management and use of habitats, the sustainable use of marine and coastal natural resources, and the management of protected areas. The programme of work also includes objectives related to alien species, food production and genotypes.

In accordance with its international conventions and commitments, and alongside the other Baltic Sea states, Finland was to establish an ecologically uniform, well-administered network of protected marine areas by 2012. In its territorial waters, Finland has achieved the area-related objectives of the Baltic Sea Protected Areas (BSPA) network, based on the Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM). In addition, on 1 March 2012 the Government decided to expand the Natura 2000 network with five new high sea areas (totalling 30 000 hectares), situated both in Finland's territorial waters and in the exclusive economic zone (EEZ) outside its territorial waters. Because of the expansion of the Natura 2000 network with the addition of the high seas areas, the percentage of BSPA areas will also increase in the EEZ, since the intention is to designate these areas as BSPAs. Although the objective set for the Baltic Sea is achieved in terms of sea area, additional efforts are required to ensure that management and use plans covering protected sea areas are ready and function properly.

The key challenge for the sustainable use of the Baltic Sea and the coastal areas is posed by lack of information on the biodiversity of underwater habitats, and the lack of detailed information on areas that are regionally, locally and species-specifically significant in ecological terms. Broad-based and reliable information on underwater habitats is also required for planning in accordance with the sustainable development of coastal zones, in line with the European Union's recommendation Integrated Coastal Zone Management (ICZM), and for the future planning of marine areas. Information is also required as a basis for establishing a favourable conservation level of underwater habitats and species, and the assessment of possible conservation measures. To facilitate the production of knowledge on marine and coastal ecosystems, the Ministry of the Environment has established the Finnish Inventory Programme for the Underwater Marine Environment (VELMU) in 2004, implemented through cooperation between the environmental administration, several ministries, Metsähallitus, universities, research institutions, NGOs and stakeholder groups.

Under the leadership of the Ministry of Agriculture and Forestry, Finland has prepared a national strategy for invasive alien species, which also deals with the issue of invasive alien species in the Baltic Sea. Finland lacks an assessment of the measures that the CBD's programme of work on marine and coastal biodiversity requires in addition to those already implemented and projects already planned.

Measures, responsible bodies and target schedules

Finland aims to achieve a regionally and biologically representative standard of conservation for marine and coastal ecosystems, in line with marine management planning, the Programme for the Protection of the Baltic Sea (2004) and other international conventions and commitments. The Act on the Management of Water Resources and the Marine Environment (272/2011) and the Government Decree on the Management of the Marine Environment (980/2011) define the objectives and measures determined for achieving a good status for the marine environment by 2020. A total of 11 qualitative indicators are applied in defining good status. One of these involves biodiversity, whereby the quality and occurrence of habitat types and the distribution and abundance of species correspond to prevailing physiographic, geographic and climate conditions. Simultaneously, the parties

responsible for implementing measures included in the act and decree are being identified. In accordance with the plan, by mid-2012, a preliminary assessment must be prepared on the current status of marine areas, a definition must be arrived at of what constitutes a good status for the Baltic Sea, and environmental objectives and indicators must be defined. By mid-2014, a monitoring plan must be drawn up, and the related implementation and action plan must be completed by 2015. The deadline for achieving the environmental objectives of the water resources management plans and implementation plans may, under certain conditions, be extended to 2021 or 2027. Although the status of coastal waters shows slower improvement than that of inland waters, the aim is to achieve a good status for them too, no later than by 2027.

As the detrimental impacts of activities altering marine ecosystems, such as construction, dredging and eutrophication of waters, are reduced, the natural state of habitat types will improve – even outside protected areas.

68) Implement the Government's resolution on Finland's Baltic Sea protection programme and substantially reduce nutrient loads into the Baltic Sea, through international cooperation. Implement HELCOM's Baltic Sea Action Plan (BSAP), alongside HELCOM's recommendations.

- Ministry of the Environment, Ministry for Foreign Affairs, Ministry of Education and Culture, Ministry of Agriculture and Forestry, Ministry of Transport and Communications, Ministry of Employment and the Economy (2013–2020)

69) Evaluate the biodiversity of Finland's coastal ecosystems by completing the Finnish Inventory Programme for the Underwater Marine Environment (VELMU). Evaluate the need for increasing the number of marine protected areas, or the need to expand the area of current protected areas.

- Ministry of the Environment, Ministry of the Interior, Ministry of Defence, Ministry of Education and Culture, Ministry of Agriculture and Forestry, Ministry of Transport and Communications, Ministry of Employment and the Economy, Ministry of Finance (2013–2015)

2.2.5.9 Fish stocks and fishing

Development challenges

The state of threatened and degraded fish stocks can primarily be improved through measures that support natural reproduction. These include restoration of potential spawning and nursery areas, construction of fishways and natural by-pass channels, removal of obstacles preventing fish migration up and down rivers, decreasing loads, and the use of natural hydrological engineering methods. The impacts of these measures will be enhanced by regulating fishing and fish introductions (Measure 95) and by providing guidance on, among others, the sustainable use of migrating fish populations.

Fish diseases are characteristically hard to predict and the disease scene changes rapidly. Disease in fish is caused by bacteria, viruses, fungi, parasites and stress-associated factors from production. Fish diseases may result in a high-number of deaths, often affecting one species in particular. More widespread epidemics may often be connected to changes in water quality and temperature, which causes the general condition and resistance of fish to weaken.

Crayfish plague is the most common cause of death in Finland's crayfish populations. This is a water mould that is widespread, and it has destroyed the population in many parts of the country. The signal crayfish, which is more resistant to the plague than Finland's native crayfish population, is partly accountable for spreading this disease.

The most significant threats include the spread of disease into new areas, and into Finland. The risks of new viral diseases and virus strains entering the country are growing alongside the import of live and slaughtered fish.

The fact that not all actors in the business are aware of the consequences of disease, or familiar with instructions and regulations on disease prevention, is elevating the risk of the spread of diseases.

Measures, responsible bodies and target schedules

70) Organise fishing and fish resource management sustainably, by overhauling the Fishing Act, based on the best available information, so as to secure the sustainable and diverse output of fish resources, their conservation and that of fishing traditions based on sustainable use, as well as safeguarding the natural lifecycles of fish stocks and biodiversity of fish resources and other aquatic ecosystems.

- Ministry of Agriculture and Forestry (2014–2020)

71) Implement a national fishway strategy to strengthen the natural reproduction of threatened populations of migrant fish, and enhance their vitality through the elimination of obstacles to migration, the development of regulation and other measures. Strengthen depleted natural fish stocks through the introduction of spawn and fry if necessary, wherever this does not involve genetic risks.

- Ministry of Agriculture and Forestry (2014–2020)

72) Implement the European Union's multiannual plan for the management of the Baltic salmon stock.

- Ministry of Agriculture and Forestry (2014–2020)

2.2.5.10 Game animals, game resources and hunting

Development challenges

Changes in agriculture, forestry and land use have altered habitats. Places of refuge for animals in field areas have almost disappeared and their numbers in forest areas have been reduced. This poses a significant threat to gallinaceous birds in particular.

Invasive alien species may also affect the biodiversity of wildlife species. Factors such as interbreeding with invasive populations may weaken the existing population or impede the success of native animal species. For instance, North American (Canadian) beaver may slow down growth in the numbers of European beaver. Invasive alien species may also influence the occurrence of diseases and parasites. Game animals may catch many diseases and parasites, such as avian influenza, rabies, tapeworm or echinococcus, and tularemia. Climate change can also pose a threat to game animal populations, such as willow ptarmigan (*Lagopus lagopus*), rock ptarmigan (*Lagopus mutus*) and mountain hare that have white winter plumage or pelage and therefore encounter problems as snowless periods become increasingly common.

Higher numbers of large carnivores and seals, and their social-behavioural impacts, including the damage caused by conflicts, pose further challenges to reconciling hunting and the conservation of species. Finland's policy concerning large carnivores and seals relies on the use of management plans as tools for reconciling various interests. Implementation of the EU's Habitats Directive in Finland's circumstances has proven somewhat problematic as concerns large carnivores. They cause damage to domestic animals and reindeer husbandry, while deer pose the same threat to forestry, transport, gardens and agriculture, and Baltic grey seals to commercial fishing and aquaculture. The damage incurred must be put into perspective in relation to population management.

Measures, responsible bodies and target schedules

Hunting will be based on principles of sustainable use. As such, it will not endanger game populations or disturb the behavioural habits or natural dynamics of game species. The vitality of game species will be preserved while

ensuring that damage caused by game animals (e.g. elk damage) is kept to an acceptable level, by means of regulating the population and preventive measures. Populations of large carnivores must be maintained on sustainable levels, while acknowledging the safety requirements of people and production animals, and biodiversity. Effective measures must be taken against poaching. This is particularly necessary with respect to large carnivores, because hunting offences against them renders the implementation of systematic large predator policies more difficult. The habitats of game animals will be developed further and safeguarded in forests, and agricultural and aquatic environments.

73) Game population management will ensure the conservation of game species habitats, their natural patterns of behaviour and annual cycles. Hunting will adhere to principles of sustainable use. Monitoring of game populations will be enhanced and, with the information gained, the sustainable use and management of game populations will be secured.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

74) Prepare and implement population management plans for threatened game species of significance to nature conservation or other social or economic aspects.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

75) Restrict damage to forestry, agriculture and transport caused by game animals, not only by planning bag limits for hunting but also through preventive measures such as fencing, repellents, game bridges, subway tunnels and salt blocks.

- Ministry of Agriculture and Forestry, Ministry of Transport and Communications (2013–2020)

76) Apply game management methods to limit the detrimental impacts of invasive alien species on native game animal populations and other aspects of nature. Prevent the introduction of new game species and populations of alien origin to Finland, and their release into the natural environment.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

77) Apply efficient measures in order to prevent poaching. Strengthen wildlife surveillance by Metsähallitus, enhance advisory services of the Finnish Wildlife Agency and improve the ability of the police to intervene in hunting offences.

- Ministry of Agriculture and Forestry, Ministry of the Interior (2013–2014)

2.2.5.11 Nature in northern regions and reindeer herding

Development challenges

According to estimates, climate change will be the most dramatic in northern regions. Rising temperatures will cause the tree line to shift gradually higher, reducing the area of bare fell region above the treeline. Invasive alien species and the movement of the tree line further and further north will lead to changes in vegetation and biota in the region, affecting the traditional use of nature in the area.

Climate change, with the associated changes in temperature, precipitation and wind conditions, is difficult to predict, and its impacts on species and various habitat types can vary greatly. It may also modify biological interaction, thereby undermining the predictability of the resulting changes. Warm winters may boost the occurrence of mycoses and pest insects (such as the damage caused by autumnal moths and European winter moths), and aggravate extreme weather phenomena, which may also slow down or prevent afforestation. Melting of palsa mires is one example of the impacts of climatic warming. Climate change poses an extremely

severe threat to arctic fell environments, and adapting to it is a challenge not only for biodiversity, but also for traditional livelihoods. Climate change threatens the conservation of the Saami people's traditional knowledge and customary use of nature, such as reindeer husbandry. The detrimental impacts of climate change on reindeer husbandry could be minimised by taking the right measures, thus safeguarding the continuity of the reindeer husbandry culture.

In the Saami Homeland, beautiful scenery, national parks and a rich natural environment attract tourists, which is extremely significant to the regional and local economy. Improperly planned land use, tourism and transport solutions over the next few years, and activities such as mechanical gold mining and gold panning, may lead to the local weakening of biodiversity and conditions for the traditional use of nature.

In the Saami Homeland, reindeer husbandry is of special cultural significance; guaranteeing its continuance requires attention to the special nature of the region in other forms of land use. Different forms of land use influence the reindeer pasture environment and reindeer husbandry in various ways, affecting the condition of pastures and status of habitat types. The condition of pastures has also suffered due to grazing pressure by reindeer and elk, and intensive forestry. The latest pasture inventories (Kumpula et al. 2009, also Mattila & Mikkola 2009) indicate that lichen pastures are highly eroded in most parts of the reindeer-herding co-operatives in the northern part of the reindeer-herding area, while reductions in the amount of lichen in pastures and the surface vegetation biomass have occurred from the mid-1990s until the period between 2005 and 2008. Fifteen percent of fell area habitats have been classified as endangered. These include habitats in both the mountain birch region and in the bare fell region above the treeline. The most significant factor in the mounting threat faced by several habitat types is intense reindeer grazing. On the other hand, grazing may also have positive impacts on some habitat types by maintaining them.

As a consequence of global warming, snow has begun to melt earlier in the spring over the last few decades. Earlier melting of snow has a major impact on the terrestrial reflection coefficient, or albedo. The albedo of snow is considerably higher than that of bare ground. Ground with no snow cover is much darker, and absorbs the majority of sunlight energy. Rich vegetation accelerates the melting of snow. Intensive reindeer grazing slows down the melting of snow in springtime, which may have a dampening effect on global warming.

Comprehensive land use planning is a prerequisite for ecologically, economically and socially sustainable reindeer husbandry. In addition to improving the ecological state of reindeer lichen, and, for example, safeguarding the regeneration of mountain birch and regulating the numbers of reindeer and elk, more attention will be paid to developing and implementing well-functioning pasture rotation schemes. New research data is also needed as a basis for planning and providing guidance in order to meet the needs of administration, business and reindeer breeders. Simultaneously, within the framework of national legislation, the voluntary Akwé: Kon Guidelines, adopted by COP 7, will be taken into account in safeguarding Saami traditional knowledge and reindeer husbandry, and in promoting the sustainable use of nature. Metsähallitus NHS is already experimenting with the Akwé: Kon Guidelines in practice.

Measures, responsible bodies and target schedules

Prepare for the consequences of climate change in northern ecosystems by enhancing research and monitoring, and establishing adaptation strategies for livelihoods. Improve the condition of pastures by reducing the pressures causing change and by adapting reindeer husbandry, as well as possible, to prevailing pasture and environmental conditions (incl. the number of reindeer and development of annual pasture rotation and grazing). Reindeer husbandry based, insofar as possible, on the sustainable use of natural pastures and their safe ecological limits would also contribute to improving the state of arctic fell environments and ecosystems, and to safeguarding the prerequisites for reindeer husbandry. In forest areas, felling practices must be improved to facilitate better preservation of winter fodder for reindeer, such as horsehair lichen in forest stands, from one generation of trees to another.

78) Guide land use in the northern wilderness and protected areas, and business based on nature tourism and biodiversity, so as to provide incentives for safeguarding biodiversity, while reconciling various interests. Promote comprehensive land use planning in arctic fell areas, utilising the Akwé: Kon Guidelines, in order to reduce conflicts between reindeer husbandry and other forms of land use, and to alleviate detrimental impacts on arctic fell environments.

- Ministry of the Environment, Ministry of Agriculture and Forestry, Ministry of Employment and the Economy, the Saami Parliament (2013–2020)

79) Develop pasture rotation in reindeer husbandry and pasture inventories in order to safeguard the carrying capacity of pastures, in cooperation with reindeer owners' associations, taking into account research data on the subject, traditional Saami knowledge of biodiversity, and other knowledge related to reindeer husbandry. Encourage reindeer owners' associations to draw up reindeer husbandry plans with multiple goals. Continue monitoring the condition of reindeer pastures and develop pasture inventory methods.

- Ministry of Agriculture and Forestry, Ministry of the Environment, the Saami Parliament (2013–2020)

2.2.5.12 Urban and built areas

Development challenges

Finland's current legislation includes tools for slowing down the loss of biodiversity in urban environments. However, not enough is known about the special characteristics of urban environments and mechanisms influencing their biodiversity. This, in turn, hampers value judgments of urban environments, formulated in pursuit of biodiversity conservation. On the other hand, research on urban environments has developed in leaps and bounds in recent years, and research results are already being applied in practice.

The national urban park model is one of the tools available for the planning of sustainable cities. The aim of this model is to preserve both the natural and cultural heritage in comprehensive, intact entities while enabling effective construction of areas undergoing change. On the other hand, it should not be forgotten that in cities even small-scale natural areas are vital to the production of ecosystem services. Although extensive areas are important both to biodiversity and ecosystem services, they cannot replace the oft-used and easily available local natural areas in cities as, say, a source of recreation and health. Since urban green spaces are linked to the natural environments of the surrounding rural areas, development challenges also extend to the countryside and the management of rural cultural landscapes. In the implementation of the associated aims, it is extremely important that rural areas remain populated.

Measures, responsible bodies and target schedules

The aim is to improve the level of knowledge of the biodiversity of urban environments and to promote the accessibility of information on nature, as a basis for land use planning and decision-making and to meet the need to monitor changes. All of this will be done in order to develop land use and other planning processes in a way that takes into account the conservation of biodiversity in urban nature and nature in built up areas; to safeguard biodiversity in urban nature and nature in built up areas, thus supporting the sustainable production of ecosystem services; to slow down the fragmentation and isolation of natural areas, through land use planning and measures for the consolidation of green infrastructure; to expand the network of national urban parks and use it as an area for testing best practices; and to increase environmental education on urban nature and nature in built up areas, and its significance to people and nature.

80) Slow down the loss of biodiversity in urban and built up areas by increasing knowledge of the subject and developing the related land use planning, so as to take into account the conservation of biodiversity.

- Encourage municipalities to evaluate unbuilt areas — significant in terms of biodiversity in urban and built up environments — and the threats they face, and to develop methods of measuring changes in them.
- Promote the protection and restoration of areas important to conserving biodiversity and the corridors between them in urban environments, and in connection with the surrounding populated and viable rural areas.
- Develop the principles and methods of planning and managing urban and built up environments, from the perspective of biodiversity conservation.
- Promote catchment basin-specific storm water programmes in urban and built up areas in order to reduce storm water volumes and enable their natural management (e.g. storm water wetlands) and to promote biodiversity. Ensure continuity of research related to storm water.

- Ministry of the Environment, Ministry of Education and Culture, Ministry of Social Affairs and Health (2013–2020)

81) Complete the network of national urban parks in Finland.

- Ministry of the Environment (2013–2020)

2.2.6 Restoration of habitats and nature management

Development challenges

Protection of ecosystems that are in their natural state and the restoration of degraded ecosystems are important both in terms of conserving biodiversity and ecosystem services, and for mitigating and adapting to climate change . According to a decision under COP-10 (Nagoya 2010), and the European Union’s Biodiversity Strategy 2020, at least 15 per cent of degraded ecosystems must be restored by 2020 as part of the global target.

It is estimated that current protected areas owned by the state and private landowners include more than 20 000 hectares of mires requiring restoration. The equivalent figure in forest restoration and nature management amounts to approximately 10 000 hectares. New needs assessments will be completed, in accordance with the METSO programme update, by the end of 2012. According to an assessment, wetland restoration and management measures are required in a total of 162 Natura 2000 sites, but work has only begun in 55 areas. Because of the METSO action plan, the number of protected areas requiring restoration is continuously growing.

The area of privately owned commercially managed forests in which nature management and restoration measures are implemented should, in accordance with the objectives of the METSO programme, be considerably increased from the current level. This will require the reorganisation of implementation and funding for nature management projects, as well as the adoption of other development measures.

Measures, responsible bodies and target schedules

Finland’s aim is to plan and implement restoration and nature management measures locally and regionally, in order to increase the nature conservation value of target sites and support the development of an ecologically functioning network of protected areas. The effectiveness of restoration and nature management will be monitored by continuing the monitoring of protected areas and expanding it to cover habitats and categories of measures that are inadequately covered at the moment. The connectivity between protected areas and surrounding areas will be improved by developing nature management in commercially managed forests. A future aim is to invest more in the restoration of open habitats not covered by the METSO programme, such as waterfowl habitats and other wetlands, so as to safeguard species and habitats typical of wetlands and populations of threatened species.

82) Restore degraded ecosystems and maintain and improve the production of ecosystem services.

- Criteria for the effective focusing of restoration will be developed in order to better select sites for restoration. Restoration of sites meeting the criteria will contribute towards achieving the global restoration target of 15 per cent.
- An expert working group will consider the needs and methods for the targeting of restoration, and the time span required for restoring degraded ecosystems.
- Develop restoration and remediation methods and their cost-efficient targeting, and methods for assessing the impacts of measures and monitoring their effectiveness.
- Expand measures more comprehensively to cover open habitats.
- Link restoration methods so as to better promote the improvement of conservation levels of threatened species and habitat types, and to enhance the ecological quality of the network of protected areas, and its functionality and connectivity, so as to provide buffering as regards climate change. The ecosystem approach should be applied in the planning of restoration measures.
- Identify possible legislative obstacles to the restoration of habitats.

- Ministry of the Environment, Ministry of Agriculture and Forestry (2013–2020)

83) Increase knowledge of the carbon balance of different types of mires, for example, the carbon-sink capacity of mires and methane emissions into the atmosphere.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

2.2.7 The Saami indigenous people and biodiversity

Development challenges

The Government Programme of Prime Minister Jyrki Katainen includes an undertaking to safeguard the cultural customs and traditions of the Saami people's use of nature, in the implementation of the national biodiversity strategy. Finland has not yet ratified the International Labour Organisation's Convention 169 concerning Indigenous and Tribal Peoples. In 1990 the parliament decided not to ratify the Convention because Finnish legislation could not be construed as corresponding to the regulations of the ILO Convention on Saami rights concerning land. The Government Programme states the intention of ratifying the aforementioned ILO Convention during the current term of office. Negotiations on a Nordic Convention on the Saami were initiated between Finland, Sweden and Norway in March 2011, with the aim of concluding them within five years.

The final report of the national working group on Article 8(j) lists 28 proposals for measures that take account of traditional Saami knowledge on biodiversity, in legislative and administrative development projects and training. The working group proposes that resources be allocated for the preservation, research on and restoration of traditional knowledge. Using the appropriate accounts and reports, Finland must also prepare to introduce indicators approved in the CBD for describing the status and development of various aspects, including traditional Saami knowledge, innovations and practices.

Collecting traditional knowledge will not suffice as such to preserve knowledge, customs and innovations in the manner required by the CBD, since threatened traditional knowledge should also be restored to the Saami community. The collection, storage and use of traditional knowledge also have ethical and proprietary rights implications. The Saami's traditional knowledge of biodiversity forms an integral part of their cultural heritage, property, traditional livelihoods and languages. Preserving such traditional knowledge must not lead to its exploitation against the will of the Saami and traditional knowledge must be maintained within the Saami community. On the other hand, databases that include traditional knowledge may be useful to preserving, reviving and restoring such knowledge.

Measures, responsible bodies and target schedules

Finland aims to promote the maintenance and preservation of the traditional Saami way of life and culture, and the northern biodiversity supporting it, within the Saami Homeland. The objective is to halt the decline in the Saami's traditional knowledge, land use practices and customary laws related to biodiversity, while ensuring that the original northern biodiversity of the Saami Homeland region is conserved in culturally sustainable ways for future generations.

When developing legislation, steering and administration regarding land use and the management, use and protection of natural resources, the prerequisites for Saami culture and traditional knowledge related to biodiversity will be safeguarded, while taking account of the voluntary Akwé: Kon Guidelines of the CBD. In order to safeguard Saami traditional knowledge, practices and innovations, Saami traditions of reindeer husbandry, fishing, hunting and handicraft will be revived to preserve traditional knowledge for future generations. Finland must also commit itself to developing the operational capabilities of the Saami, including the status of women in particular, while securing the opportunities of the Saami to take part in such activities at all necessary levels. The Ministry of the Environment will appoint a new Article 8(j) working group in the spring of 2013.

84) With respect to taking into account traditional Saami knowledge on biodiversity, efforts to examine the conditions for ratifying the ILO's Indigenous and Tribal Peoples Convention will be continued in accordance with the objective included in the Government Programme, bringing to conclusion negotiations on a Nordic Convention on the Saami. The implementation of measures presented in the final report of the Article 8(j) working group will continue. For justified reasons, these measures will be revised and completed in the new Article 8(j) working group, and proposals for measures will be submitted to the monitoring working group for approval.

- Ministry of Justice, Ministry for Foreign Affairs, Ministry of Education and Culture, Ministry of Agriculture and Forestry, Ministry of the Environment, the Saami Parliament (2013–2015)

85) Prepare to implement the indicators adopted by the meeting of the Conference of the Parties to the Convention concerning linguistic diversity, the status and development of land use and traditional livelihoods in the Saami Homeland, and the status and development of traditional knowledge, innovations and practices.

- Ministry of the Environment, Ministry of Justice, Ministry of Education and Culture, Ministry of Agriculture and Forestry, Ministry of Employment and the Economy (2013–2015)

2.2.8 Challenges and measures related to genetic diversity

2.2.8.1 Conservation of genetic resources for agriculture, forestry and fisheries

Development challenges

National programmes based on international conventions and action plans related to the protection of genetic resources, guide work on genetic resources. The implementation of such programmes has proceeded to the extent permitted by the resources available. In order to achieve a sustainable basis for the resources required for such work, in 2010 the Advisory Body for Genetic Resources decided to appoint a working group to examine the securing of long-term protection for genetic resources. The working group's assignment covered agricultural and horticultural plants, forest trees and domestic animals. The working group found it necessary to examine whether the protection of genetic resources should be made statutory in order to secure a sustainable resource base for work with genetic resources. On the basis of this proposal, a report that was jointly commissioned by the Ministry of Agriculture and Forestry and the Ministry of the Environment was completed in 2012. This report serves as a

basis for actual legislative work. The project also examined the measures required from Finland in order to ratify the Nagoya Protocol of the Convention on Biological Diversity.

To safeguard native varieties, rapid measures and notification of the need to find seeds are required to save landraces of field crops, because these varieties are disappearing. Landraces can be registered as varieties of native plant species, in accordance with the decree on varieties of native plant species that entered into force in 2009 and which was extended to cover vegetables. The decree is based on the relevant EU directives. By registering a variety of native plant species, the applicant is entitled to propagate and market the variety within the restrictions provided in the decree, such as a limited quantity of seed marketed each year. The main effect of maintaining a register of native plant species lies in preserving crop genetic diversity under cultivation conditions. As yet, there is no clear insight into how the decree on varieties of native plant species is functioning, but at present it covers 13 varieties and growers (2011). Monitoring and assessment are therefore required with regard to the implementation of the decree. Agri-environmental subsidies should be extended so as to apply to the cultivation and conservation of native plant species, including horticultural plants (on-farm and in garden conservation), in the same way as to native breeds of domestic animals.

Permanent and adequate resources for the conservation of plant genetic resources require additional resource allocations to MTT Agrifood Research Finland, particularly for the maintenance of collections. According to a proposal by a sub-group of the National Advisory Body for Genetic Resources, MTT Agrifood Research Finland has an annual need for human resources amounting to 9.95 man-years, and for consumption expenditure of €333 000. Without resources and training, the involvement of various parties in conservation activities will be challenging. The extensive use of plant genetic resources (as such, for research and plant breeding purposes), and the development of products and marketing measures are among the key measures contributing to the sustainable use of genetic resources. Conditions for their implementation include diverse project activities and expert knowledge, and support for these.

Special support contracts for maintaining the cultivation of native plant species, based on the agri-environmental scheme, have proven insufficient to promoting in situ conservation on farms — only ten farmers have concluded a contract on maintaining the farming of an old landrace variety. The conditions of agri-environmental support for native plant species are considered to be too complicated and therefore farmers are not willing to cultivate such varieties. A special support scheme should also be prepared for the landrace varieties of horticultural plants. At present, they do not have any support scheme at all. So far, within agri-environmental support, we have not succeeded in drawing up support measures of this kind that the European Commission would be prepared to accept.

The form of support included in agri-environmental support and represented by breeding contracts and conservation programmes for native breeds has had a positive impact on the conservation of these breeds. In fact, it has facilitated a delay in, or has even prevented, the reduction in the population of certain breeds. In recent years, the population numbers of the Finnish landrace chicken, Åland sheep, Kainuu grey sheep, eastern and northern Finncattle and Finnish landrace goat have actually increased, while those of the Finnhorse and western Finncattle have remained unchanged and the numbers of the Finnsheep have decreased. The main reasons for the decrease in populations of native breeds have been output levels below those of dominant breeds, and changing agricultural practices.

Domestic forest trees grow on the northern fringes of their range. Experimental transfers have proven that tree origins and varieties transferred here from elsewhere cannot thrive in most cases. Forest trees are long-lived plants that have to endure high temperature variations in our current climate. In addition, climate change requires greater capacity to adapt than before. Conservation of the genetic diversity of tree species is also vital to preparing for climate change. A sound legislative basis, so far lacking, must therefore be established to facilitate this.

The occurrence of sea trout (*Salmo trutta*) populations in headwater regions and their vicinity, and the possibilities for protection and use of these species (e.g. through pisciculture), should be assessed. Attention

should also be paid to the conservation of brackish-water stocks of grayling (*Thymallus thymallus*) through pisciculture. If the volume of breeding fish stocks is reduced substantially, genetic diversity will suffer. As a consequence, the number of genetic forms maintained will decrease. The Finnish Game and Fisheries Research Institute maintains a live gene bank (brood fish stock) of 16 fish species or varieties and 54 different stocks, and a milt bank, storing male specimens of 12 fish species or varieties, and 42 different stocks. The majority of fish species bred are threatened. Conservation of threatened fish species is promoted through the Protection Strategy for the Saimaa salmon (2003) and management programme (2012), and the Protection Strategy for the Saimaa arctic char (2006). Management programmes are being prepared for the Vuoksi River lake brown trout and Vuoksi River grayling populations.

Measures, responsible bodies and target schedules

The aim is to ensure the conservation of diversity in crops and horticultural plants (landrace varieties in particular, and modified populations of old cultivars), and to secure resources for conservation activities. Conservation activities will be developed, both by enhancing conservation methods and by expanding the conservation network. In addition, the coverage of high security storage will be increased. In order to promote conservation on farms, the possibilities for extending agri-environmental support to cover the protection of native plant species in farming too, will be examined, or other forms of support developed. In addition, an in situ conservation programme for naturally occurring relatives of crops will be launched. In the long term, the sustainable use of agricultural plants and horticultural plants will be promoted by enhancing their availability and communication work on them, and by launching project activities to promote their utilisation.

It must be ensured that the landrace breeds of domestic animals do not become extinct, and that their genetic variation is preserved as extensively as possible. Efforts will be made to ensure a gene bank for cattle breeds. Breeding subsidies for landrace breeds will hopefully continue. In order to maintain the genetic diversity of domestic animal breeds, taking into account the significance of each breed would be important to determining the amount of subsidy paid in each case. Breeding programmes should pay attention to the adaptation of landrace breeds to Finnish conditions. In addition, related competencies in domestic animal genetics, breeding and safeguarding the genetic resources of domestic animals, will be maintained and strengthened. Long-term conservation of genetic resources in forest trees and the sustainable use of these trees will be secured. The genetic diversity of Finland's fish stock will be maintained.

86) The need for statutory regulation of the conservation and use of genetic resources in Finland will be examined and necessary measures will be taken according to such an analysis. With the help of the Rural Development Programme, the conservation of native varieties and breeds will be secured alongside the further processing of products based upon them.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2016)

87) An in situ conservation programme for naturally occurring relatives of crops will be launched.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2014)

88) Ensure the conservation of genetic diversity in forest trees in line with the national programme on plant genetic resources, taking into account the obligations listed in the international EUFORGEN programme and guidance from the National Advisory Body for Genetic Resources.

- Ministry of Agriculture and Forestry (2013–2020)

89) Ensure the conservation of threatened native fish species and populations, while also conserving genetic diversity. Continue the maintenance of brood fish stocks (i.e. living gene bank) and frozen milt, with the aim of maintaining the broadest possible genetic diversity of brood fish stocks producing roe for stocking. Maintain the genetic diversity of economically significant fish stocks through a variety of measures, including regulation of

fishing, restoration of water bodies, improvement of water quality and safeguarding the possibilities for fish migration between breeding and growing areas, while maintaining, and if necessary, increasing the numbers of brood fish stocks and the size of the milt bank.

- Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

90) Enhance the monitoring of genetic diversity of fish stocks and their sub-stocks. Reduce unwanted adaptations of populations that are raised at fish farms, through new farming methods and by renewing brood fish stocks. Include measures for reducing the genetic erosion of fish stocks caused by fishing and stocking activity, as part of management plans for fish stocks.

- Ministry of Agriculture and Forestry (2013–2020)

2.2.8.2 Genetically modified organisms

Development challenges

Possible environmental risks posed by genetically modified organisms (GMOs) may be realised both through natural interaction and those caused by human activity. Such risks may extend to the biodiversity of wild species, cultivated plants and production animals. Climate change is a major challenge facing agricultural ecosystems, particularly the diversity of crop plant varieties. If the climate changes as predicted, many plant varieties cultivated in Finland will probably have to be rebred on a tight schedule, in order to enable their adaptation to changing climate conditions. Resistance of plant varieties to environmental stress factors (e.g. drought and diseases) is a key feature in terms of breeding.

In comparison with traditional plant breeding, breeding that utilises gene technology is faster, and in certain respects, more specific. Combined with new genome information, it may therefore facilitate better utilisation of native varieties of crops well adapted to different conditions, and of native species and relatives of wild species, as breeding material. Expanding the use of native species and relatives of crop plants also promotes their conservation. If plant cultivation cannot be adapted to changing conditions, a substantial loss in the diversity of cultivated varieties may well be the result. On the other hand, it may be possible to replace the narrower range of domestic varieties with non-native cultivated plant varieties and species.

When examining the impact of genetically modified varieties of cultivated plants on the biodiversity of wild species, special attention must be paid to their resistance to non-selective herbicides such as glyphosate, which is globally the most commonly used application of genetic modification. Use of a non-selective herbicide can lead to an almost complete destruction of the natural weed species in a field, and the biota dependent on such flora, at least locally. In the case of large-scale cultivation in particular, this may affect valuable ecosystem services (e.g. pollination of cultivated plants and biological control of pest insects). Varieties resistant to insect attacks may also have an effect on other parts of the ecosystem in the field. On the other hand, if resistance to insect attacks only applies to a certain pest insect, the need to use insecticides could decrease, which may have a favourable impact on the insect fauna and ecosystem services of the field.

Genetically modified mammals used as production animals involve a minor probable direct environmental risk. Although research is being conducted on genetically modified production animals with a positive impact on the environment (e.g. a genetically modified pig able to better utilise phosphates in feed), it is unlikely that commercial applications will become available in the near future, due to ethical issues that have been connected to genetically modified animals.

Transgenic insects and fish constitute the highest environmental risk. The use of aquaculture as a source of human nutrition will increase in the days to come. Transgenic fish are interesting due to in-bred characteristics, which improve their resistance to disease or enhance their metabolism of feed and raise their ecoefficiency. Because new characteristics can improve the competitiveness of cultivated transgenic fish in natural waters, for

the time being they have not been approved for commercial production e.g. in the United States. In other parts of the world, transgenic ornamental fish and pets are also on the market. In an attempt to solve the problem of spreading of transgenes, certain organisms, such as transgenic insects and fish used in food production, have been modified to render them infertile. However, complete and permanent infertility has not been achieved and this approach has not facilitated acceptance on the markets either.

In Finland, scientific assessment and monitoring of the environmental impacts of the use of genetically modified organisms is reliable and of a high standard.

In 2010, the European Commission proposed that EU Member States be given more authority to decide on restricting or banning the cultivation of genetically modified plants. Finland is in favour of Member States having the right, for justified reasons included in the Commission's regulatory proposal on the matter, to restrict or ban the cultivation of a certain genetically modified plant or group of plants, or all genetically modified plants in their territories. Grounds for such a ban or restriction could include national environmental policy objectives and/or local conditions that are not taken into account in the EU's centralised risk assessment. Such environmental grounds could include objectives related to the conservation of certain natural or landscape features, habitats and ecosystems, and specific ecosystem functions and ecosystem services.

According to the Government Programme of Prime Minister Jyrki Katainen, it is important that EU Member States have the right to declare their territory free of GMO cultivation.

2.2.8.2.1 Cartagena Protocol on Biosafety

Development challenges

The increasing use worldwide of GMOs has led to the need to regulate their international transfers from one country to another. The Cartagena Protocol on Biosafety is an international environmental treaty attached to the Convention on Biological Diversity (CBD). It was supplemented by the Nagoya–Kuala Lumpur Supplementary Protocol on Liability and Redress, adopted at the COP 10 meeting in Nagoya on 15 October 2010. The Protocol on Biosafety that entered into force internationally on 11 September 2003 (in Finland, 17 October 2004), has been ratified by 162 states and the European Union. The Supplementary Protocol, signed by 50 states and the European Union, will enter into force 90 days after 40 states, all parties to the Protocol, have submitted a ratification or acceptance document, or an accession document. Finland signed the Supplementary Protocol on 11 May 2011. At the moment 21 states have ratified the Protocol.

The aim of the Cartagena Protocol on Biosafety is to ensure, in advance, that living modified organisms are transferred, handled and used (particularly in cross-border movements) in a manner that has no adverse effects on the conservation and sustainable use of biological diversity, while taking into account impacts on human health. The Protocol may also contribute to developing and supporting administration, legislation and research related to biosafety in developing countries and countries in transition. Requirements on documents and identification applicable to international transfers, and comprehensive risk assessment and control, play a key role in terms of the supervision of imports. The Nagoya–Kuala Lumpur Supplementary Protocol includes provisions on liability and procedures related to redress for damage caused to biodiversity when resulting from the transboundary transfer of GMOs. The requirements of the Cartagena Protocol on biotechnology are taken into account in the EU legislation on gene technology and are included in Finland's national legislation.

Measures, responsible bodies and target schedules

The aim is that transfers of living genetically modified organisms (LMOs) comply with the instructions and regulations of the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, and the Nagoya–Kuala Lumpur Supplementary Protocol on the handling, transport, packaging and identification of LMOs, as well as risk assessment and control, liability for damages, and redress. Finland actively participates in the development

and implementation of the Cartagena Protocol on Biosafety, and is seeking the entry into force (ratification) of the Nagoya–Kuala Lumpur Supplementary Protocol in April 2014.

91) Develop multidisciplinary research to identify the impacts on biodiversity of GMOs, and support research into risk assessment and the control of GMO applications developed in Finland, in particular as concerns ecological impacts related to transferred traits.

- Ministry of the Environment, Ministry of Education and Culture, Ministry of Agriculture and Forestry, Ministry of Social Affairs and Health (2013–2020)

92) Analyse the indicators used in existing monitoring systems and their suitability for monitoring the functioning of GMOs and impacts on biodiversity. If necessary, new indicators suitable for monitoring will be developed.

- Ministry of the Environment, Ministry of Agriculture and Forestry, Ministry of Social Affairs and Health (2013–2020)

93) Promote research and development of GMO applications, considered safe in terms of biodiversity, which improve the state of the environment. Develop scientific and administrative assessment and decision-making procedures regarding GMOs, to cover impacts on biodiversity on a broad scale. Seek to identify, and if necessary, ban at the permit application stage, any GMOs whose use may have an adverse impact on biodiversity.

- Ministry of the Environment, Ministry of Education and Culture, Ministry of Agriculture and Forestry, Ministry of Social Affairs and Health, Ministry of Employment and the Economy (2013–2020)

94) Finland will continue to pursue the right of EU Member States to ban or restrict, for justified reasons, the cultivation in their territory of GMO plants approved for cultivation in the European Union.

- Ministry of Social Affairs and Health, Ministry of Agriculture and Forestry, Ministry of the Environment (2013–2020)

95) Finland will see to it that the provisions of the Nagoya–Kuala Lumpur Supplementary Protocol on biosafety, subordinate to the CBD, enter into force nationally in 2013.

- Ministry of Social Affairs and Health, Ministry of Agriculture and Forestry, Ministry of the Environment (2013)

2.2.8.3 Access to genetic resources and the equitable sharing of benefits

Development challenges

Prior to ratifying the Nagoya ABS (Access and Benefit-Sharing) Protocol, Finland will examine the national legislative measures, new legislation, if any, and the implementation system required for the ratification of the protocol. The system to be devised, and its implementation tools, will be harmonised with other national, international and EU legislation on genetic resources. The starting point for the system controlling access to genetic resources and sharing of benefits is the basic principle of the Convention, establishing the full rights of states to their own natural resources. Hence, states can themselves determine the tools they use for achieving the Convention's goals.

Measures, responsible bodies and target schedules

Finland wishes the benefits gained from the commercial or other utilisation of genetic resources to be shared between the states providing them, in accordance with procedures jointly approved in international agreements governing the field, and sustainable in terms of the environment and biodiversity. Finland also intends to implement the provisions of the Nagoya ABS Protocol, on the transfer of genetic resources and sharing of

benefits, in such a way that Finland is ready to ratify the protocol simultaneously with the European Union and other Member States.

96) Identify the necessary legislation and provisions required by the Nagoya ABS Protocol for the implementation of national ABS legislation on the transfer of genetic resources, as well as benefit sharing and the development of administrative procedures, in accordance with Article 15 of the Convention, taking into account the obligations of other international agreements. The National Advisory Body for Genetic Resources in charge of agricultural genetic resources will examine the national obligations required for the implementation of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).

- Ministry of the Environment, Ministry of Justice, Ministry of Agriculture and Forestry (2013–2020)

2.2.9 International measures in support of the implementation of the Convention on Biological Diversity

2.2.9.1 Resource mobilisation strategy

Development challenges

The aim of the global strategic plan 2011–2020 (Aichi targets, in Nagoya, 2010), approved by the Parties to the Convention, is to halt the loss of biodiversity by 2020, obtain the required resources and establish the required financial and administrative tools (incl. green accounting, incentives and tax policies and new resources). Among other measures, the strategy includes objectives for the protection of habitat types, in the achievement of which eliminating poverty among the population groups dependent on such habitats will play a key role. Another aim is to mainstream the conservation and sustainable use of biodiversity within the public administration and various activities undertaken within society, while alleviating pressures on biodiversity and promoting the sustainable use of biodiversity. It would also be important to secure fair access to genetic resources and the fair distribution of benefits gained from them, between indigenous peoples and the local population, for instance, when developing medicines derived from natural sources.

As a party to the Convention, Finland is committed to considerably strengthening economic, intellectual and technical resources that promote the conservation of biodiversity and its sustainable use. Without additional resources from all possible sources of funding, greater operational efficiency, private sector participation and, among other measures, setting the appropriate incentives and eliminating subsidies detrimental to biodiversity, the goals set cannot be achieved in Finland, let alone developing countries. Key elements in this process include the financial assessment of ecosystem services and payments received for producing ecosystem services (Payments for Ecosystem Services (PES)). In multilateral funding, funding targeted at the Global Environment Facility (GEF) is a key issue. More than one quarter of the total funding for GEF has been allocated to measures supporting the Convention. The Innovative Funding Mechanisms (IFM) negotiated within the framework of the CBD, and jointly agreed on, assist in enhancing the efficiency of measures. A prerequisite for obtaining international support under the CBD is that participant developing countries commit themselves to the objectives of the Convention and manage their contractual obligations.

Measures, responsible bodies and target schedules

Finland will examine its possibilities for increasing its economic, intellectual and technical resources in implementing the COP-10 Strategic Plan 2011–2020, seeking to identify resources from all suitable sources in accordance with the process adopted by COP-10. National implementation of the commitment depends on the availability of resources within spending limits set out in central government budget frameworks. This work will be steered in line with the needs assessments developed and reported by all Parties to the CBD. Bearing in mind the difficult situation in the public economy, resulting from the Europe-wide financial crisis, it is clear that funding for the work cannot be solely based on public funding by industrial countries. For instance, after the adaptation

measures taken by the Finnish government, it is unlikely that any substantial additional funds can be allocated to implementation of the CBD.

However, Finland finds it important that conservation of biodiversity and its sustainable use be integrated in all measures taken within society. Simultaneously, among other measures, any subsidies with a detrimental and distorting effect on biodiversity must be identified. As stated in Economic incentives and other incentive measures, the aim is to utilise biodiversity indicators and indicators for ecosystem services (under development) in decision-making, and to develop their role in measuring sustainable development and well-being to complement GDP data.

97) In national and international activities (incl. development cooperation), Finland is seeking to implement the global strategy of the Convention on Biological Diversity and its objectives and goals (2011–2020) for halting the loss of biodiversity. For this purpose, by 2015, Finland will prepare a national strategy for mobilising resources, in accordance with decision X/3 of the Convention, and the related financial indicators.

- Ministry of the Environment, Ministry for Foreign Affairs, Ministry of Finance, Ministry of Agriculture and Forestry (2013–2015–2020)

2.2.9.2 Cooperation in multilateral environmental agreements and processes (e.g. IPBES)

Development challenges

Ecosystem services based on biodiversity are integral to the well-being of humankind. Finland's aim is to promote the conservation of biodiversity through international agreements, processes, funding and political influence. This requires active participation in international negotiations on environmental agreements, in which Finland takes account of the position, obligations and special needs of developing countries when implementing the agreements, which include the IPBES panel. The aim is to take into account such needs and obligations even when negotiating new agreements. In addition to the reconciliation of multilateral environmental agreements and processes, there is the objective of developing cooperation on foreign policy measures, particularly tasks that support developing countries. Likewise, Finland is seeking to strengthen cooperation between the European Commission and Member States in the conservation of biodiversity, particularly in eastern Central Europe, which is a key area for Finland. Finland also strives to enhanced collaboration in CDB issues with developing countries e.g. in the context of development cooperation dealing with management of natural resources.

Through more-efficient and better decision-making, the intergovernmental scientific body for biodiversity and ecosystem services (Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services (IPBES)), aims to strengthen the dialogue between science and decision-making in biodiversity and ecosystem services issues, and to prevent global loss of biodiversity. The objective of IPBES, which covers marine, inland water and terrestrial ecosystems, is to promote the conservation and sustainable use of biodiversity and to safeguard human well-being and sustainable development in the long term.

Measures, responsible bodies and target schedules

98) Through the United Nations Environment Programme (UNEP) and the Global Environment Facility (GEF) Finland will actively support measures that promote the conservation and sustainable use of biodiversity. Finland, through Ministry for Foreign Affairs, has provided initial financial support 200 000 euros to IPBES in 2013.

- Ministry for Foreign Affairs, Ministry of the Environment (2013–2020)

99) Finland will actively participate in international contractual negotiations related to biodiversity and negotiations promoting their synergies, taking into account the position and special needs of developing countries in implementing agreements and negotiating agreements. A network of contact persons for biodiversity

agreements will be established to support the implementation of the action plan and international efforts to harmonise functions under the agreements.

Finland will participate in the activities of the Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services (IPBES). Finland will examine national needs and measures related to IPBES, the organisation of work at home, and Finland’s support for the international IPBES.

- Ministry of the Environment, Ministry for Foreign Affairs, Ministry of Agriculture and Forestry, Ministry of Education and Culture (2013–2020)

2.2.9.3 Development cooperation and transfer of technology

Development challenges

Ecosystem services maintained by biodiversity are a key factor in almost all of the UN’s Millennium Development Goals. Ecosystem services provide livelihoods, maintain and safeguard health, and provide food security and shelter from natural disasters. Biodiversity is thus very broadly linked to development as a whole, not only the environmental aspect of sustainable development. Biodiversity is an essential aspect of sustainable development, because it produces ecosystem services vital to humankind, and contains future opportunities for utilising genetic resources. At the same time, the significance of biodiversity is emphasised in preventing global socio-economic threat factors, such as the poverty issues facing developing countries.

The conservation of biodiversity and its sustainable use in developing countries, particularly by safeguarding the functioning of ecosystem services, is an extremely important objective. This is especially true with regard to the livelihoods of the poorest. Ecosystem services play a key role, for instance, in regulating floods, preventing droughts, maintaining food security and health, and providing potable water.

Ecosystem services, whose functioning depends on biodiversity, constitute substantial capital, even in monetary terms. Such capital needs to be managed carefully. This applies to developing countries in particular, because a substantial part of the range of biodiversity is found in developing countries, whose research and development capacity is weak in this field. It is important that research capacity in biodiversity be enhanced in developing countries, in order to ensure the availability of high standard scientific information, from both industrial and developing countries.

The economic consequences of biodiversity loss are severe: according to expert estimates, a reduction in biodiversity could have a negative impact of up to seven per cent per year on global GDP. The world’s poorest people and indigenous peoples suffer the most, as their living conditions are depending on local biodiversity. Regarding the conservation of biodiversity and the sustainable management and use of natural resources, improving the position of women as users of biodiversity and as decision makers on biodiversity issues is also crucial.

Measures, responsible bodies and target schedules

In addition to the primary objective of Finland's Government-approved Development Policy Programme (2012) — the elimination of poverty — development policy also assists in finding solutions to other global challenges, such as the unsustainable use of natural resources and climate change. One of the four priorities of the programme is the sustainable management of natural resources and the achievement of environmental protection. In this context, the programme states, for instance, that the implementation of the Rio conventions on biodiversity, climate change and desertification has clear development impacts and interlinkages, and synergistic solutions should be sought.

Finland’s development cooperation also takes into account the objectives and obligations of environmental conventions. Finland’s development cooperation in the environmental sector must promote the objectives and

measures of biodiversity protection, its management and sustainable use, in ways that are systematic and cost-efficient and by supporting the capabilities of developing countries. Aspects related to biodiversity and ecosystem services will also be highlighted in bilateral relations with developing countries, as appropriate.

100) As part of the implementation of the Development Policy Programme and by taking the equality perspective into account, Finland seeks to support development cooperation projects aimed at reducing poverty in developing countries, through the conservation and sustainable use of biodiversity, and with the objective of safeguarding and strengthening ecosystem services. In addition, Finland seeks to promote opportunities for young experts to participate in development cooperation projects and programmes under this theme.

- Ministry for Foreign Affairs (2013–2020)

101) In development cooperation, Finland takes into account the goals and obligations of the Convention on Biological Diversity and other international biodiversity agreements. Viewpoints concerning biodiversity and ecosystem services will be highlighted in bilateral relations with developing countries, encompassing development cooperation projects and political influence.

- Ministry for Foreign Affairs (2013–2020)

2.2.9.4 Regional cooperation

Finland is obliged to contribute to maintaining biodiversity in the northern coniferous forest belt, that is, boreal ecosystems. For Finland, changes in boreal ecosystems in our neighbouring regions are important. Finland has engaged in active nature conservation cooperation with Russia, whose territory covers up to 60 per cent of the world's boreal forests. The volume of forest resources in Russia is exceptional and the special characteristics of the forest ecosystems are unique. For instance, these natural old-growth forests have extremely high biodiversity.

Some of Russia's extensive old-growth forest sites are located in northwest Russia, a region close to Finland, where the pressure for utilisation of forest resources is increasing. Finland's participation and indirect responsibility for the sustainable use of forest resources in Russia are emphasised by the fact that the Finnish forest industry is the largest importer of timber from northwest Russia. National and international measures must therefore be employed in order to achieve a balance that, on the one hand, secures the conservation of biodiversity in boreal ecosystems in Finland's neighbouring regions, and on the other, safeguards the sustainable use of natural resources. Promotion of the conservation of the Fennoscandian Green Belt, that is, the zone along the border between Finland and Russia, is the key to cooperation aimed at the conservation of biodiversity in our neighbouring regions.

Development challenges

Safeguarding the viability of species' populations in Finland will require not only national measures, but also the conservation of interconnected areas that allow for the movement of species, particularly those areas adjacent to Russia, in order to supplement our own species populations. Northwest Russia is home to old-growth forests and natural sites that are unique within Europe, and their preservation should be secured. In addition, the objective of maintaining biodiversity in the marine environment of the Gulf of Finland is common to Finland, Russia and Estonia. Cooperation and exchange of experiences is necessary, for instance, for the preparation of the marine Natura 2000 sites of Finland and Estonia. In the next few years, this perspective should receive greater emphasis, alongside other important themes related to the Gulf of Finland. With regard to marine ecosystems in the Gulf of Finland, bilateral nature conservation efforts between Finland and Estonia, and also Finland and Russia, are being expanded into tripartite cooperation. Finland, Russia and Estonia are also organising a joint Gulf of Finland Year in 2014, with five key research topics as its main themes: maritime safety in winter conditions, bio- and geodiversity, ecosystem health, fish and fishing, and maritime spatial planning. These focal themes are also linked to the implementation of the action plan of the Baltic Marine Environment Commission (HELCOM) and the EU's Marine

Strategy Directive. Close cooperation with Estonia and Sweden is underway in the preparation of management measures for the marine environment.

Measures, responsible bodies and target schedules

In cooperation with Russia, Finland is seeking to promote the establishment of an internationally comparable network of protected areas in northwest Russia, to complete the network of protected areas in the Fennoscandian Green Belt, to develop the activities of the green belt and enhance its international significance, and to safeguard biodiversity in the commercial utilisation of forests in the area. Simultaneously, measures in accordance with the Memorandum of Understanding on cooperation on the development of the Green Belt of Fennoscandia, signed between the governments of Finland, Russia and Norway in 2010, will continue nationally and in cooperation with Russia and Norway. The intention is to make the Fennoscandian Green Belt a model tool for cross-border cooperation in nature conservation, and to give it a higher international profile.

The tools for seeking to achieve nature conservation objectives related to regional cooperation and cooperation with neighbouring regions are the programme of work on marine and coastal biodiversity under the Convention on Biological Diversity, and implementation of the EU's Habitats Directive in the Gulf of Finland together with other EU countries. In addition, the aim is to gain up-to-date information on the biodiversity status of the northern parts of Fennoscandia and development forecasts through the Arctic Council's CAFF working group's CBMP monitoring programme and the ABA assessment report. In line with the implementation of Finland's Arctic Strategy, the aim is to promote the conservation of biodiversity in northern regions, to highlight the special characteristics of the Arctic region and its risks, and to utilise the Arctic Council's assessments and recommendations as a basis for decision-making. Arctic research, and the development of regional climate models and long-term monitoring of the state of the environment, will also be developed as a basis for decision-making, while strengthening the national coordination of Arctic research and monitoring.

102) In cooperation with Russia and Norway, Finland will promote the formation of the cross-border Fennoscandian Green Belt.

- Initiate conservation biology research and development projects related to the formation of the Fennoscandian Green Belt, including climate change and the related changes in habitats and species, and the spread of invasive alien species. Continue active international cooperation in research and between experts in preparing adaptation strategies for the northern boreal coniferous forest belt and possible regional strategies for the Baltic Sea area.
- Establish the Kalevala park on the Finnish side and prepare a plan for the protected areas of the Fennoscandian Green Belt in Finland, as part of legislative drafting. Continue and strengthen park twinning cooperation and apply for funding, for example, from the European Union, for implementing these projects.
- Establish a national working group to promote the Fennoscandian Green Belt and its activities.
- Initiate a joint expert cooperation working group and network for Finland, Norway and Russia to coordinate initiatives and cooperation related to the Fennoscandian Green Belt, and to maintain contacts with the European Green Belt.
- Encourage regional councils and local actors to participate in the enhancement of cooperation related to the Fennoscandian Green Belt. Encourage local actors to initiate regional development and nature tourism projects related to the Green Belt.

- Ministry of the Environment, Ministry of Agriculture and Forestry (2013–2020)

103) Implement the project for the Barents Region protected area network (BPAN; 2011–2013), in order to establish a functioning network of protected areas in the region and to implement the CBD's Programme of Work on Protected Areas. Information produced in the project will also support research into the impacts of climate change.

- Ministry of the Environment (2013)

104) Continue and develop European and Nordic cooperation to promote the conservation of biodiversity within boreal ecosystems, and the same level of cooperation between Finland and the Baltic countries (Estonia, Latvia, Lithuania).

- Ministry of the Environment (2013–2020)

2.2.10 Monitoring of the national strategy and action plan

Development challenges

The National Strategy and Action Plan for the Conservation and Sustainable use of Biodiversity 2012–2020 was prepared by the broad-based working group promoting the implementation and monitoring of the national strategy and action plan 2006–2016 for the conservation and sustainable use of biodiversity in Finland, including representatives of the relevant key national actors from the public and private sector, alongside stakeholder groups and non-governmental organisations.

The intent of the working group is to gain joint insight into how the implementation of the strategy and action plan should be organised within administration, and how stakeholders who have contributed to programme preparation might participate in this activity, upholding citizens' constitutional rights to own and possess land, and complying with every citizen's responsibility for the conservation of biodiversity.

The working group's task description covers not only the monitoring of the implementation of the strategy and action plan, but also assessment of trends in the state of biodiversity, assessment of the need for refocusing the strategy and action plan, and the development of constructive interaction between administrative sectors and other actors.

Measures, responsible bodies and target schedules

In many ways, the objectives of the Convention on Biological Diversity are connected to the decisions of the Johannesburg (2002) and Rio+20 (2012) conferences on sustainable development. The aim is to reconcile and implement the Strategic Plan of the Convention, and the 2020 biodiversity targets, with the other Rio conventions (climate change and desertification) and international agreements on biodiversity. Collaboration between these processes must be ensured.

In connection with the interim assessment (2015/2016) of the National Strategy and Action Plan for the Conservation and Sustainable use of Biodiversity, an assessment must be made and account taken of the conformity and joint effectiveness of policy definitions agreed on in relation to other processes. The interim assessment should also support national reporting required by the Convention on Biological Diversity. Implementation of the National Strategy and Action Plan should anticipate priorities under national reporting that require more broad-based preparation, such as reports. The European Union intends to implement its interim assessment in early 2014.

Correspondingly, when reforming Finland's sustainable development strategy, its ecological sustainability objectives, indicators and monitoring programme must take into account the policy definitions of the National Strategy and Action Plan for the Conservation and Sustainable use of Biodiversity 2012–2020 and the EU's Biodiversity Strategy.

105) Monitor and assess the implementation and effectiveness of Finland's National Strategy and Action Plan for the Conservation and Sustainable use of Biodiversity 2012–2020.

- Monitoring and assessment will be implemented cost-efficiently in cooperation with ministries, stakeholders, business and industry, while employing the indicator-based approach recommended in the Convention on Biological Diversity.
 - Develop indicators for monitoring and assessing the implementation of the strategy and action plan.
 - By the end of March 2014, the working group will compile the fifth national report on the state of biodiversity and implementation of the Convention's obligations in Finland, for the Convention on Biological Diversity.
 - A national interim assessment of the strategy and action plan will be carried out in 2015/2016.
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- Ministry of the Environment, all ministries (2013–2020)

2.3 RECENT ACTIONS AND EXAMPLES

Q7: What actions has your country taken to implement the Convention since the fourth report and what have been the outcomes of these actions?

An important task for the near future is the **implementation of protection measures** in line with the protection targets for Natura 2000 areas, in order to achieve and maintain a favourable conservation status. Establishment of protected areas, by issuing regulations on areas allocated for this purpose, is a key component of these measures^v. Other required actions include the development of monitoring and planning systems, and the preparation, implementation and maintenance of plans for land management and use. It must also be ensured that account is taken of the measures required in Decision X/31 on protected areas in COP-10 of the Convention, within the implementation of the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity 2012–2020.

Development of a network of protected areas in the action plan period 2012–2020 will be largely based on voluntary conservation. As the number of new protected areas and that of the related, necessary tasks increases, additional resources will be required, either by increasing funding or reallocating resources.

The objective is to halt the deterioration in the threat status of habitats by 2020, and to use effective measures to improve their status. This requires the preservation and restoration of functional entities related to habitats, even outside protected areas, and the development of guidance methods and incentives for this purpose, through cooperation between various sectors. Achieving a green and blue infrastructure (an ecological network), in order to maintain the conservation status of habitats, requires broad-based shouldering of responsibilities, not only by various administrative sectors but also municipalities, enterprises and other actors.

Protection of species is primarily carried out through the protection and management of habitats. Securing the future of the most threatened species requires individually planned conservation measures in each case. While species-specific conservation programmes are required in approximately 500 cases, for the time being it has proven possible to prepare them for 150 species only. One means of protecting species in need of specific conservation would involve placing them under strict protection, by a decision of the authority in charge of nature conservation, in order to secure the site hosting the species. So far, some 170 such decisions have been made (1998–2000), but more than 1 000 would be necessary. Up-to-date, accurate and more-comprehensive information on the occurrence of threatened species, and advice and instructions on methods of protecting them, are required in order to take account of threatened species in the utilisation of nature outside protected areas. Data contained in the environmental administration's TAXON database, including GIS data on threatened species, remains deficient in many aspects.

Enhance knowledge and understanding of the status of and trends in species in Finland, and ensure the monitoring of the most threatened species, in particular those placed under protection. At the same time, halt the declining trend in species numbers and counter threats to their habitats, by promoting the protection, management, research and monitoring of species and their habitats, and through communications work in the field. Implement an action plan for species protection that steers and prioritises current species protection and sustainable use measures, by focusing such measures on key targets. Simultaneously, agree on the division of duties between organisations and prepare a description of the resources required. In addition, research and the compilation of information would enhance knowledge of threatened species, which would facilitate a reliable assessment of the threatened status of most species in our country. Assessing the threat posed to and conservation status of species, during reporting for the Habitats Directive, would serve the monitoring of biodiversity.

The Finnish Government continued the **forest biodiversity programme for Southern Finland (METSO)**, with the aim of reaching the programme's conservation goal of 96 000 hectares by 2020. The state paid compensation to private forest owners and acquired forests from voluntary sellers. In the METSO programme, the state notifies forest owners of its forest acquisition interests and the forest owners can offer their land for conservation and be compensated for it, or sell their land to the state. The programme has made excellent progress. The coverage of protected areas increases year after year. The only constraint seems to be the amount of state funding partly because of the difficult economic situation and recession in Europe. Conservation has gained wide acceptance among forest owners as an alternative to the conventional, commercial management of forests. The coverage of nature reserves on land owned by the state, municipalities and other public communities continued to increase, and the aim is to protect 20 000 hectares of new land by extending the network.

Besides increasing the area of protected areas, the METSO programme has objectives for safeguarding biodiversity in privately-owned forests by the measures funded under the Act on the Financing of Sustainable Forestry. The aim is to safeguard natural values in smaller sites that require specific forms of management, in sites where natural values are changing, and in sites where they may be preserved alongside forestry measures. The goal is to increase the total area of sites where biodiversity is safeguarded by the measures funded under the Act on the Financing of Sustainable Forestry by 82,000 hectares. These measures include environmental support for forestry and nature management projects.

Mire conservation was promoted by extending the protected areas and increasing active restoration methods. On 30 December 2012, the government made a resolution on the sustainable and responsible use and conservation of mires and peatland. The drafting of the supplementation programme for mire conservation is part of the implementation of the resolution. The objective of the resolution is to supplement the network of protected areas by adding 100 000 hectares of new mires to it. Peat is used as fuel, as desiccant in cattle sheds and as substrate in gardens and greenhouses. The aim of the resolution is to target new peat production zones to mires that are no longer in their natural state, for example, due to ditching. Peat production is targeted to drained mires or mires whose natural state has otherwise been significantly altered.

The government issued a proposal to parliament on the **amendment of the Environmental Protection Act**, in order to improve the protection of mires. The proposal includes a regulation that would require carrying out a natural values assessment on the area before granting a permit for peat production. New peat production could not be targeted at mires that are in their natural state or that have special natural value. Discussions on the act were in progress in parliament at the time of writing this text. The amendment would also have wider significance, because the currently effective Environmental Protection Act only regulates emissions. The proposed amendment would, for the first time, include the protection of biodiversity and sustainable use under the scope of application of the Act.

An extensive package of new forest acts and related decrees has entered into force in the beginning of 2014, as an outcome of the most comprehensive reform process for decades. The package comprises amendments to the Forest Act and Forest Management Associations Act, a new Forest Damages Act, Act on the Placing on the Market of Timber and Timber Products, and parts of the Timber Measurement Act concerning the measuring of energy wood. The acts were prepared in collaboration with various stakeholders.

The amendments to **the Forest Act** (see also Part III) increase the freedom of choice of forest owners in managing their own forest property, improve the profitability of forestry and operating conditions of wood-producing industry, and enhance measures aimed to safeguard the biodiversity of forests. One important objective in the reform was to have less detailed regulation on the treatment of forests and to clarify the legislation. The most important changes include allowing uneven-aged forest stands, abolition of age and diameter limits in regeneration, more diverse range of tree species, and increase in habitats of special importance. Notification of the establishment of seedling stands is no longer required and supervision is targeted to the results of regeneration, for which new minimum limits have been specified.

In 2014, the Ministry of the Environment set up a working group to promote the **restoration of degraded ecosystems**. This work implements the governmental strategy and action plan for the conservation and sustainable use of biodiversity in Finland. The strategy and action plan require Finland to contribute to achieving the goal of increasing the restoration area globally and regionally (EU) by 15% by 2020, in accordance with the Aichi targets and the European Union biodiversity strategy.. The work is conducted as broad-based cooperation between the Ministry of the Environment, the Ministry of Agriculture and Forestry and a wide range of experts and stakeholders. A report compiled by an expert working group nominated by the European Commission will be used in the process.

The working group has derived and agreed on a procedure that is scientifically and ecologically valid. Derivation is based on a 10 step procedure in which four major categories of steps needed are: i) empirically determine the current state of the habitats, ii) determine the degree of improvement in the state of the habitats that each of the restoration measures provides, iii) determine the cost of the restoration measures and finally iv) illustrate how we can achieve a prioritization of restoration actions based on the previous steps. The procedure is not based on threshold values or categorization of habitat statuses, but rather utilizes continuous measurable variables, and as such it relies less on expert opinion type of information.

Metsähallitus is responsible for the maintenance and use of nature reserves. It restores forests and wooded mires and maintains wooded natural heritage sites and other valuable habitats. In addition to state-owned reserves, Metsähallitus is responsible for the restoration and maintenance of wooded habitats in privately-owned protected areas. By the end of 2010, the Metsähallitus Natural Heritage Services had restored and managed over 33 000 hectares of forest ecosystems in state-owned nature reserves as a part of the METSO-programme. Open seminatural grasslands, among other open ecosystems, are excluded from the METSO programme. The annual management cover around 1 500 hectares of open seminatural grasslands and restoration of 4 000 hectares open mires. In 2008–2010, we have restored 150 hectares of mires and forests and 300 hectares of valuable natural sites in privately-owned protected areas. The LIFE funding from the European Union has also played an important role in the restoration works in recent years. The largest LIFE-Nature project in Finland, the Boreal Peatland LIFE, is active in 2010–2014. As part of the project, Metsähallitus will restore nearly 4 300 hectares of mires. Metsähallitus has cooperated with experts to develop restoration methods for the protected areas, and it monitors the efficiency of the restoration and management operation.

In June 2013, the Ministry of the Environment set up an **ecosystem services and biodiversity planning group**. This work implements the government programme entry on launching a research programme on the evaluation of the economic importance of biodiversity and ecosystem services. Several rather wide-scale research and development projects related to the theme of ecosystem services and biodiversity have been conducted in Finland in recent years. In addition to these, there have been smaller projects that specify the concept of ecosystem services further.

The aim of the working group is to raise general awareness on ecosystem services, in order to structure and implement the ecosystem service goals included in the 2012–2020 strategy and action plan for the conservation and sustainable use of biodiversity in Finland. Furthermore, the working group promotes research and development work on the theme, with special attention paid to the wide array of benefits produced by ecosystems. The working group drafts, monitors and promotes communication on ecosystem services, enhances cooperation between the authorities and various research institutions on projects related to ecosystem services – such as the objectives of the 2020 European Union Biodiversity Strategy – and prepares Finland’s opinions for international ecosystem services meetings, such as IPBES (**Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services**).

Biodiversity is also an aspect of **urban areas**, and many urban dwellers place great value on natural diversity. In accordance with the Land Use and Building Act, Finnish cities can apply for a permit from the Ministry of the Environment to set up a national urban park. The protection of natural and cultural heritage in a national urban park is steered by land use plans and various conservation decisions. The cities must specify the means of safeguarding the preservation of the natural and cultural heritage elements within the area designated as an

urban park in their applications. The natural and cultural heritage values must be cherished and promoted when maintaining and developing national urban parks. In order to meet these goals, the cities must draft a maintenance and use plan for the area, and have it approved by the Ministry of the Environment. The citizens and owner stakeholders must be provided with an opportunity to participate in the drafting of the plan. There are six national urban parks in Finland. One of them – the national urban park of Turku – was founded during the reporting period on 5 June 2013. Turku is one of the oldest urban areas in Finland, which makes the newly designated national urban park particularly valuable.

The Saimaa ringed seal (*Pusa hispida saimensis*) is indigenous to Finland and only found in Lake Saimaa. It is classified as Critically Endangered (CR) in the 2010 Red List of Finnish Species that follows the IUCN classification of endangered species, and its risk of extinction is very high. The Saimaa ringed seal is defined as a species under strict protection in the Nature Conservation Decree, and as a species in need of strict protection in the Habitats Directive (Annexes II and IV of the Habitat Directive). Nowadays, the greatest threats facing the Saimaa ringed seal include fishing nets, the narrowing of its habitat, disturbances during nesting and environmental toxins. The population is also vulnerable to changes caused by climate change. Improved protective measures, such as the net fishing restrictions in spring, have yielded results and the seal population has increased in recent years. In 2012, the estimated winter population of the Saimaa ringed seal was 310 specimens. The Ministry of the Environment released the strategy and action plan for the protection of the Saimaa ringed seal on 20 November 2011. The aim of the strategy is to make the Saimaa ringed seal population increase steadily and to keep the size, composition and distribution of the population at a favourable conservation status. The intermediate target is to increase the Saimaa ringed seal population to 400 specimens by 2025. The actions needed to achieve the strategic goals were defined and their implementation was commenced. The European Commission granted funding for the Safeguarding the Saimaa Ringed Seal LIFE project. The five-year project supports the protection of the Saimaa ringed seal and the achievement of a favourable conservation status for the species through various actions. The Safeguarding the Saimaa Ringed Seal LIFE project is the largest LIFE project in Finland, in terms of the amount of EU funding granted. The estimated cost of the project is EUR 5.26 million, of which EUR 3.95 million is funding from the European Union. The EU funding notably enhanced the prerequisites for implementing the strategy and action plan for the protection of the Saimaa ringed seal. The winter was exceptionally mild in Finland in 2013–14. Lake Saimaa froze late and there was little snow. The scarcity of snow, in particular, posed a serious threat to the reproduction of the Saimaa ringed seal, because the species nests in caves made in the snow. Metsähallitus and a number of volunteers built artificial piles of snow in the nesting areas of the Saimaa ringed seal. The results can be assessed in spring 2014. This is a tangible example of how the permanent effects of global climate change on Finland's climate could hamper the future of the Saimaa ringed seal, a species that lives in Lake Saimaa as a relic of the Ice Age.

The marine area of Finland is part of the Baltic Sea, which is a large brackish water body separated by the Danish straits. Its characteristics, such as the low salt content and a variety of environmental problems, are a challenge for the marine environment. Many underwater biotypes and species are endangered. The Finnish Inventory Programme for the **Underwater Marine Environment** (VELMU) collects data on the underwater marine biotopes and species, and on their distribution in the Finnish marine area. The main goal of the programme is to promote the protection of the species in the Baltic Sea and the marine environment and the sustainable use of natural resources. VELMU includes surveys on both the inorganic (geologic, physical and chemical) and organic (species and communities) qualities of the marine environment. These two together are the backbone of the valuable habitats, biotypes and underwater landscapes typical of the Baltic Sea. The surveys are conducted, in particular, for the purpose of investigating seabed habitats and the distribution of aquatic plants, macroalgae and invertebrates in them. The VELMU surveys aim to locate the most valuable areas in terms of species and biotopes, and the hosts of species that need special protection. Underwater biodiversity can be safeguarded by protecting the most valuable areas and controlling the pressures to exploit the areas. The inventory is led by the Ministry of the Environment, in cooperation with seven other ministries. SYKE and Metsähallitus are responsible for the practical inventory work and the handling and recording of data. The surveys were extended to cover all coastal areas of Finland during the reporting period. The inventory is due in 2015, but the work is likely to continue after the project ends. The collected data will be used, for example, to plan the maintenance and use of the marine

protection areas included in the European Union Natura 2000 network, and for marine environment planning regulated by the Marine Strategy Framework Directive.

There has been a notable shift towards themes related to the importance and management of ecosystem services in the **research on biodiversity policy** during the reporting period. There are several projects in progress that aim to arrive at a national perspective on the topic that became the focus of international biodiversity policy in the 10th meeting of the Conference of the Parties to the CBD in Nagoya. In environmental administration, ecosystem services and their importance for human well-being are widely recognised. The concept of ecosystem services and its economic implications are still not well known among decision-makers and other actors outside environmental administration, such as officials and lobbyists. Furthermore, the concepts of TEEB and the green economy are new, and their content, meaning, share and potential in decision-making and practical operations have not yet been fully understood.

In 2013, the Ministry of the Environment ordered a research project from the Finnish Environment Institute. The aim of the research is to estimate the current status and future development of the most important ecosystem services in Finland, as well as their economic importance and role in the promotion of green economy. In addition, the project will make recommendations on how to improve the integration of ecosystem services into core political processes, and how to steer the protection of natural capital and ecosystem services. The project will also produce information on the most important topics requiring further research in the field. The project is executed in cooperation between the Finnish Environment Institute (SYKE), the Agrifood Research Finland (MTT) and the Institute for European Environmental Policy (IEEP). SYKE is responsible for the ecological and socio-economic expertise needed for the project, MTT's main role is to evaluate ecosystem services, and IEEP will harness the knowledge base and expertise of international TEEB projects (TEEB Global, TEEB Nordic) to support the Finnish TEEB project. Expert groups will be set up in connection with the project, comprising experts from universities, public research institutions, different administrative and business organisations and other relevant parties (such as the Metsähallitus Natural Heritage Services and the Finnish Forest Centre). The operation of the working groups is supported by workshops organised during the project, which will also feature representatives of stakeholders and NGOs. Special attention will be paid to the control, support and maintenance services and cultural services that have not yet been thoroughly investigated in Finland. The identification and evaluation of these services could reveal new information to support the protection, sustainable use and administration of ecosystems that are crucial for the production of ecosystem services. The results of the project will be presented in the final report that will be released by 31 October 2014.

Examples

Ecosystem Services and Human Health – An Argumenta Project

Background: Biological diversity and well-functioning ecosystems are providing valuable goods, but also essential services for human health and well-being. The research and the knowledge on the relationship between natural environment and human health, for instance diverse ecosystems and human allergies, have advanced recently in Finland. However, as our research on this topic is quite scattered, Finland has established a project called "Ecosystem Services and Human Health" (2013–2014).

Objectives: The aim of the project is to produce a wide-ranging summary of the links between ecosystem services and human health; and to develop a collaborative national platform for different scientific fields studying ecosystem services with the focus on human health and well-being. The purpose is: 1) to map the variety of links between ecosystem services and human health; the occurrence of health benefits (both mental and physical) provided by ecosystem services, as well as their meaning, values and effects in different contexts; and 2) to find new approaches to develop multidisciplinary research on ecosystem services and human health and well-being; as well as how to implement these results to urban planning and decision making in natural resource management.

The project will produce multidisciplinary knowledge that enhances the health and wellbeing of people, and improves the state of the environment. The collaboration of researchers and decision-makers during the project will hopefully promote the creation of new innovative research projects and new implications for regional planning and policymaking. The project integrates viewpoints from ecosystem research, economics, ecology, political sciences, medical sciences, health sciences, social sciences and psychological sciences among others. Both experts and policymakers participate in the project.

Process: This, almost a two year discussion platform, is carried jointly with the researchers and decision-makers of health and natural science sectors. Also the media is involved. The project is jointly carried out by the Finnish Forest Research Institute (Metla) and the Finnish Environment Institute (SYKE).

For reaching the set goals, the Finnish Forest Research Institute and the Finnish Environment Institute will organize the following “Ecosystem services, human health and well-being” workshops and seminars: a) two multidisciplinary workshops for researchers; b) two workshops for planners, policymakers and researchers; and c) a seminar for the media.

The themes of the project include: 1) Ecosystem services that affect human psychological health and wellbeing; 2) Comprehensive studies about the links between ecosystem services and human health; 3) Understanding ecosystem services affecting health and multi-criteria analysis of them; 4) How to better acknowledge and take into account the health benefits of ecosystem services in regional planning and in the management of natural resources.

Financier: The project is financed by the Finnish Cultural Foundation. Argumenta funding is intended to stimulate dialogue between researchers in different fields of science on significant current subjects of research.

Results: The final results of the project are foreseen to be published at the end of 2014.

National Strategy and a Government resolution for Mires and Peatlands

The Ministry of Agriculture and Forestry, together with the Ministry of Employment and the Economy, set up a working group to prepare a national strategy for mires and peatlands on 10 February 2009. The objective of the strategy was to create an up to date understanding of the diversified and sustainable use of mires and mire nature and peatlands and reconcile the different needs relating to the use of mires and peatlands. The proposal of the working group for a national strategy for mires and peatlands was submitted to the Minister of Agriculture and Forestry on 16 February 2011. In 2012, the Finnish Government approved a resolution on the sustainable and responsible use and protection of mires and peatlands based on the national strategy for mires and peatlands.

The resolution on the sustainable and responsible use of mires and peatlands defines the objectives and measures relating to the sustainable and responsible use of mires and peatlands. Sustainable and responsible use reconciles the different objectives of the use of mires and peatlands so that a significant social, economic and ecological benefit can be derived from their use. The objective is to secure the benefits and energy supply from agriculture and forestry, reduce the harmful impacts on waters and climate, enhance a favourable conservation status for mire nature and promote the multiple use and cultural services.

The sustainable and responsible use of mires and peatlands is reconciled by directing new land use which considerably change the mires to such mires and peatlands which have been drained or whose natural state has otherwise been significantly altered as well as by implementing sectorspecific strategies and measures promoting sustainable and responsible use.

In addition, the strategy for mires and peatlands presents the main research needs for promoting the sustainable use of mires and peatlands.

National Strategy on Invasive Alien Species

Finland's National Strategy on Invasive Alien Species was completed in April 2012. The purpose of the strategy is to prevent damages and risks caused by invasive alien species (IAS) to the Finnish nature, sustainable use of natural resources, livelihoods and well-being of the society and people. The strategy was adopted by a Government Resolution on 15 March 2012. The proposal for Finland's National Strategy on Invasive Alien Species was prepared in collaboration between a broadly-based working group and experts, involving a total of more than 100 people.

The objective of Finland's National Strategy on Invasive Alien Species is to minimise the threat and damage caused by invasive alien species, both those already present in Finland and the potential ones. The aim is to take action at the earliest stage possible to combat invasive alien species, because this is the most effective and far less costly approach to prevent damages caused by IAS.

Dealing with the harmful impacts of invasive alien species requires a clear division of responsibilities between actors and a wide range of measures. The Action Plan for Finland's National Strategy on Invasive Alien Species puts forward 16 measures, 12 against all invasive alien species and 4 against specific groups of species. Invasive alien species and potentially or locally harmful alien species have been identified from among all alien species in Finland (in 2011). A total of 157 invasive alien species permanently established in Finland which cause clearly identifiable, direct or indirect damage have been identified. A significant share of these species (100 species) is alien agricultural and forestry species. Some of them may also constitute a threat to the indigenous natural environment. Of the alien species in other groups, 5 occur in the territorial waters of Finland in the Baltic Sea, 5 in inland waters, 6 are land vertebrates, 24 are plant species, and 9 are indoor pests. In addition, 123 potentially or locally harmful alien species which may cause direct or indirect damage have been identified in Finland. About a third of these is agricultural and forestry species. Most of the potentially or locally harmful alien species are already present in Finland, while some of these are still outside our national borders.

Indigenous Saami people and traditional knowledge

A permanent post for an environmental secretary was established in the Saami Parliament in 2013. The secretary acts as a presenting official of environmental matters and her special task include duties related to Article 8(j). The Article 8(j) working group has been appointed by the Ministry of the Environment to ensure the realisation of the goals of the NBSAP related to Saami people. Awareness of issues related to Article 8(j) and of Saami traditional knowledge has increased clearly during the past years in governmental organisations. On a municipal level the development has been slower.

The Akwé: Kon Guidelines were piloted in the drafting of the Management and Land Use Plan for the Hammastunturi Wilderness Area in 2011–2013. The experiences from this internationally trail-blazing process were encouraging. The perceptions of the Saami community were integrated into the plan in a close dialogue with Metsähallitus (representing the land owner). As a result a permanent operation model has been established for Metsähallitus when dealing with the use of natural resources and management of protected areas in state-owned areas in the Saami Homeland.

2.4 MAINSTREAMING

Q8: How effectively has biodiversity been mainstreamed into relevant sectoral and cross-sectoral strategies, plans and programmes?

2.4.1 Bringing biodiversity into the mainstream

During the reporting period, special attention was paid to mainstreaming and communications. Since 1997, the CBD decisions have been implemented in Finland within the framework of the NBSAP. The drafting and monitoring of the NBSAPs takes a broad-based approach. The drafting and implementation of the NBSAP is managed by a diverse working group that consists of ministries, expert organisations, NGOs and stakeholders. The potential of the social media and the Internet and open dialogue with citizens were exploited during the reporting period, especially during the NBSAP drafting stage. There has been a communications group working under the broad-based working group since 2007. Its members include communications professionals from the relevant ministries, expert organisations and Finland's national public service broadcasting company Yle, as well as biodiversity experts. The communications group drafted the communications strategy for biodiversity matters and it drafts the annual action plans. The working group meets regularly to coordinate cooperation and discuss the efficiency and means of communication, among other things.

Finland's biodiversity strategy's five objectives focus on the mainstreaming of biodiversity issues across society, the introduction of new participants in the work to advance biodiversity causes, a decision-making process based on robust research data, and Finland's responsibility, as a member of the international community, for global biodiversity. The strategy also outlines policies linking the Saami community's traditional knowledge to the protection of biodiversity.

Legislation on nature conservation will be developed to respond to the challenges posed by the degradation of biodiversity, while ensuring the full national implementation of EU regulations on nature conservation. Biodiversity will be taken into account in steering systems governed by other legislation, particularly in the Environmental Protection Act currently under reform and Forest Act, which came into force at the beginning of 2014. In addition, legislative and administrative measures will be revised and developed, while the range of steering instruments will be expanded to rely more on various actors taking responsibility and engaging in voluntary action.

Sustainable management of forests taking into account among other things the forest biodiversity has been developed since the Forest Act came into force in 1997. In addition, forest certification has been essential part of sustainable forest management during the last 15 years promoting biodiversity in all kinds of forests in Finland.

Particular attention is paid to sustainable use of natural resources. Renewable resources should be used in a manner that ensures their genuine renewal and does not deplete them, while non-renewable resources should be used as eco-efficiently as possible. The aim of natural resource economy is to enhance well-being and competitiveness, improve the security of supply in Finland, and contribute to the implementation of various other policy objectives relating to the use of natural resources. At the same time it creates conditions for loosening the linkage between the use of resources and the economy as well as for a recycling-based economy where economic growth does not increase the exploitation of unrenovable natural resources or environmental loading. Renewable natural resources can be used to substitute for the use of unrenovable ones.

For example, forest management has followed principles of sustainability for a long time. At first, sustainability was viewed from the perspective that forests regenerate themselves. However, in the Forest Act that entered into force in 1997, biodiversity of forest nature was brought as a goal together with the economical sustainability. Criteria and indicators, including biological diversity, have become an established instrument for assessing and

monitoring sustainable forest management (see State of Finland's Forests 2011, <http://www.metla.fi/julkaisut/seuranta/pdf/state-of-finlands-forests-2011.pdf>). All the aspects of sustainability have been included in the Finnish National Forest Programme (NFP, http://www.mmm.fi/attachments/metsat/kmo/64ytYHceF/NFP_2015_Turning_the_Finnish_forest_sector_into.pdf), where strengthening forest biodiversity, environmental benefits, and welfare implications is one of the three objectives (see Part III). The current NFP is valid until 2015, but a new one will be prepared in 2014.

It is challenging to take biodiversity perspectives into consideration on a broad scale. For instance, methodologies for taking account of indirect and accumulative impacts on nature are undeveloped and this is often disregarded. The reason is the associated projects are distinct, rendering it impossible to ensure broader-based progress with respect to the same natural area at the landscape level. It is particularly challenging to develop land use planning methods that go beyond the current practice of merely stating conditions towards a more extensive and flexible understanding of biodiversity trends. Correspondingly, in planning, the integration of sustainable use and conservation of biodiversity is a major challenge.

Environmental impact assessment is often solely focused on the occurrence of certain species and habitats in the area under planning. It has not been possible to a sufficient extent to distinguish the structural features of nature, and their natural development, or the significance of observations made on the habitat level, species level and genetic level. On the other hand, biodiversity is highly appreciated by citizens. An interactive approach to impact assessment on the national, regional and local level is necessary in order to include citizens' views, alongside those of experts, in value judgments of nature. (ref. p. 10 Action Plan 2013-2020)

Ecosystem services based on biodiversity are integral to the well-being of humankind. Finland's aim is to promote the conservation of biodiversity through international agreements, processes, funding and political influence. This requires active participation in international negotiations on environmental agreements, in which Finland takes account of the position, obligations and special needs of developing countries when implementing the agreements, which include the IPBES panel.

In addition to the reconciliation of multilateral environmental agreements and processes, there is the objective of developing cooperation on foreign policy measures, particularly tasks that support developing countries.

2.4.2 Implementation of Article 8(j) work programme and the Saami Parliament

The working programme of the Saami Parliament for 2012–2015 includes a principal goal related to the implementation of the recommendations made by the Article 8(j) working group. In more detail, the programme includes the following objectives:

Protection of traditional Saami knowledge

- The Saami Parliament takes part in the implementation, monitoring and evaluation of the National Biodiversity Strategy and Action Plan effectively and promotes the swift implementation of goals related to Saami people. Sufficient resources are allocated to the Saami Parliament to take part in the implementation of the NBSAP.
- The Saami Parliament takes part effectively in the ratification process and implementation of the Nagoya Protocol.
- The implementation of projects aiming at revitalising traditional knowledge has begun.
- The Saami Parliament pays due regard to the needs of the intergenerational continuation, transmission and development of traditional Saami knowledge in all its activities.
- The Saami Parliament promotes the foundation of a centre of research for traditional Saami knowledge.

Protection of the Saami cultural environment

- Akwé: Kon guidelines are fully followed in the land use planning of the Saami Homeland.
- The Saami Parliament follows the principles of sustainable development including the mitigation of climate change in all its activities to ensure the vitality of the Sami Homeland as well as the continuation of Saami culture to future generations.
- The Saami Parliament takes active and effective part in the implementation of the action plan for improving the state of threatened habitat types in Finland in the Saami Homeland.
- The Saami Parliament promotes the implementation of the European Landscape Convention and takes active and effective part work related to it.
- The Saami Parliament takes active and effective part in decision making related to climate change including the formulation and implementation of climate change adaption policies.
- The Saami Parliament ensures that the clauses against compromising Saami culture in the Mining and Water Acts are followed in full in practice. Consulting the Saami people living in the impacted area the Saami Parliament takes effective and well-informed part in the impact assessments required by the Mining and Waters Acts. Sufficient resources are allocated to the Saami Parliament to take part in the implementation of the Mining Act.
- The Saami Parliament takes effective part in the drafting of the national sustainable development strategy and Society's Commitment to Sustainability. The Saami Parliament prepares, with funding from the government, a sustainable development strategy for the Saami people which will be included in the national strategy and will oblige officials.

2.4.3 Development Policy

Decision-in-Principle of the Government of Finland (2012) on Finland's Development Policy Programme states that through development policy and cooperation Finland supports protection of environment and biodiversity as well as promotes sustainable use of natural resources. In so doing, the basic preconditions for life are preserved for future generations. Impoverishment of nature has serious economic and social consequences, and the overthrowing of nature's balance is a threat also to human well-being.

According to the Development Policy Programme Finland promotes sustainable management of natural resources and environmental protection inter alia by supporting the conservation of biological diversity locally, nationally and globally as well as ensuring the rights of local communities; emphasising the position and specific needs of developing countries and in particular the position of women in negotiations on environmental agreements and when implementing the decisions; reinforcing indigenous peoples' right to use natural resources; promoting sustainable management and use of natural resources, such as forests; and developing good environmental legislation and governance.

PART III:
PROGRESS TOWARDS THE 2020
AICHI BIODIVERSITY TARGETS AND
CONTRIBUTIONS TO THE
RELEVANT 2015 TARGETS OF THE
MILLENNIUM DEVELOPMENT GOALS



3.1 PROGRESS TOWARDS AICHI BIODIVERSITY TARGETS AND PROGRESS TOWARDS MILLENNIUM DEVELOPMENT GOALS

Q10: What progress has been made by your country towards the implementation of the Strategic Plan for Biodiversity 2011–2020 and its Aichi Biodiversity Targets?

The symbols used in this report on each Aichi target: Actions in relation to each Aichi target and results during the 5th reporting time period 2011–2014 (NBSAP FINLAND 2012–2020).



Strong positive action and target reached



Moderate action



No action or no initiative taken yet

3.1.1 The Aichi Biodiversity Targets one by one

Aichi target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

National target 1: Finnish people have at least a basic knowledge of biodiversity and are aware of its significance and their own opportunities to contribute to its conservation and sustainable use.



Education is in central role in improving the knowledge on biodiversity. Sustainable development and biodiversity are integrated into education at all levels.

In 2013 the Government decided on the future distribution of lesson hours in basic education. In grades 1-6 (7-12 years-of-age) environmental and natural studies will in future form an entity which will promote the use of phenomenon based education. The aim is to widen the understanding on nature's phenomena, on their interactions as well as on their consequences. Sustainable development perspective will be integrated into the environmental and natural studies. The National Core Curricula for Basic Education is currently being reformed and the new curriculum will be introduced in August 2016.

National Board of Education evaluated in 2010 the cross-curricular themes (for example sustainable development) of the current core curricula. The evaluation revealed that in addition to knowledge and skills the pupils need to be motivated to take responsible and environmentally aware actions.

Communication programme for the National Strategy and Action Plan for the Conservation and Sustainable use of Biodiversity 2013–2020

The communication programme for the National strategy and action plan for the conservation and sustainable use of biodiversity 2013–2020 was updated in 2013. The programme now corresponds with the policies of the global biodiversity strategy and action plan. To support this update, an analysis was conducted of the state of biodiversity communication in Finland.

The most important goal of the communication programme is to promote biodiversity becoming mainstream – that more people, groups or organisations wish to operate in order to halt the loss of biodiversity and have knowledge of how to do so. The plan states that communication must be appealing, focused and impassioned. Biodiversity should also be linked with other important environmental issues such as climate change, food security and ecosystem services.

The communication programme has six theses for influential communication as well as core messages (directed to companies, decision-makers, scientific communities and citizens as well as globally) offer practical tools for more influential communication on biodiversity. The communication programme can be freely used by anyone and is available on the homepage of the Ministry of the Environment (www.ymp.fi/en-US).

On the last Saturday of August 2013, Finnish nature received its first holiday. **Finnish Nature Day** is intended to remind Finns of the joys of nature and its importance to our wellbeing. The first-ever celebration included a main event at the Finnish Nature Centre Haltia, along with almost a hundred smaller events around the country. Over 70 organisations from associations to ministries participated in organising these events, and over 9,000 Finns took part in them. Even though these events were organised for one day only, the key point is that we all can celebrate Finland's natural beauty anyway we see fit, wherever and with whomever we wish. Finnish Nature Day is now an annual celebration and, in the years to come, participation will be expanded to include schools, businesses and other groups. **The 2013 Finnish Nature Day** received a lot of media attention, both from the traditional media, as well as on social media.

Communication on biodiversity in Finland is co-ordinated by a communication team set by the Ministry of the Environment. A uniform look has been created for the Finnish communication programme, as well the use of a **Biodiversity logo**, which each member organisation of the communication team should adhere to when communicating about the conservation and sustainable use of biodiversity.

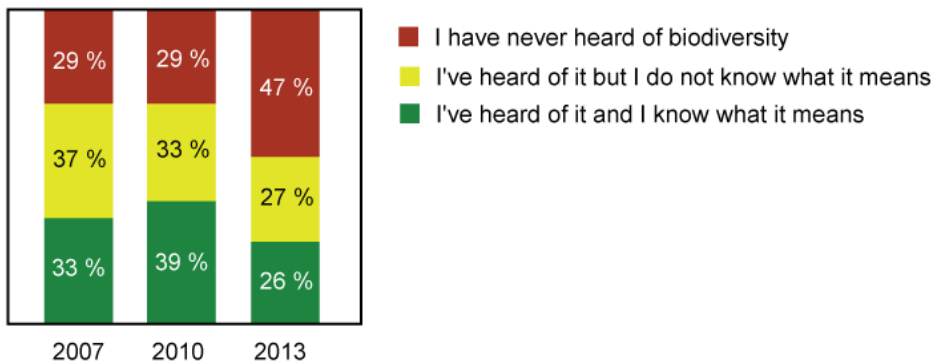
The communication team produces the **"Luonnon kirjo" (the diversity of nature) newsletter** four times a year and the **"Luonnon puolesta" (for nature) blog** every week. The purpose of the newsletter and the blog is to offer current, inspiring and versatile content on biodiversity. The communication team also organises press events and seminars when needed and distributes information on biodiversity by taking part in different kinds of public events.

- The communication programme for the National strategy and action plan for the conservation and sustainable use of biodiversity 2013–2020 (Finnish and English): [ym.fi/fi-FI/Luonto/Luonnon_monimuotoisuus/Strategia_ja_toimintaohjelma/Seurantaryhma](http://www.ymp.fi/fi-FI/Luonto/Luonnon_monimuotoisuus/Strategia_ja_toimintaohjelma/Seurantaryhma)
- Finnish Nature Day (Finnish): suomenluonnonpaiva.fi
- "Luonnon kirjo" Newsletter (Finnish): syke.fi/fi-FI/SYKE_Info/Viestintaaineistot/Uutiskirjeet/Luonnon_kirjo_utiskirje
- "Luonnon puolesta" blog: luonnonpuolesta.wordpress.com
- Luonnon merkitys virkistys/luontomatkailu tiedote 25.3.: [http://www.ymp.fi/fi-FI/Luonto/Selvityksen_mukaan_luonnon_virkistyskayt\(28745\)](http://www.ymp.fi/fi-FI/Luonto/Selvityksen_mukaan_luonnon_virkistyskayt(28745))
- [Report on the outcome of the VILMAT Action Plan in 2003](#) ~~(pdf)~~

Versatile outdoor activities and opportunities

Outdoor activities in nature, bird watching and forest work are among the activities that are more popular in Finland (VILMAT Action Plan 2003–2012). Running, Nordic walking and technical sports, such as rock climbing, gained the most popularity proportionally. The popularity of fishing decreased slightly. Most Finns have ample opportunities for outdoor recreation near to their homes. The average distance to the nearest forest is 700 metres, but a good half of the population lives within 200 metres of forests. The average distance to an urban park is about one kilometre. 41 percent of Finns have regular access to leisure houses. In the case of most people, the basic outdoor recreation skills have remained at the same level as ten years ago.

Q: Have you ever heard of the term biodiversity?



Q: In your opinion, how serious is the decline of biodiversity?

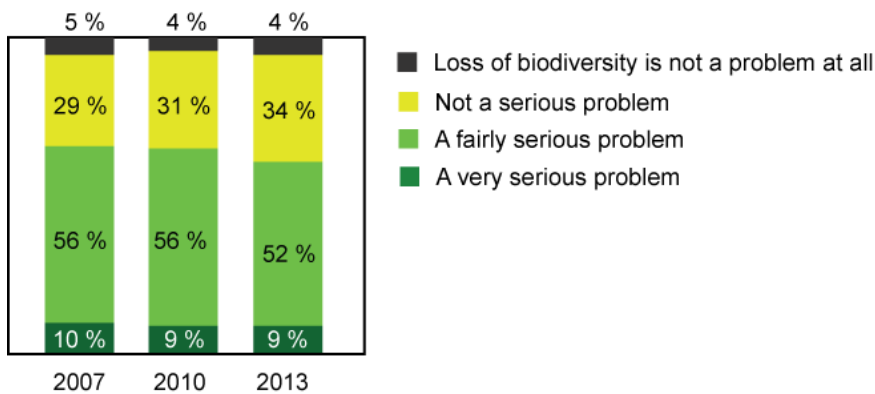


Figure 28. Biodiversity awareness and attitudes of the Finns. Source: Eurobarometer / European Commission.

Finland's national strategy for sustainable development "Towards sustainable choices - A nationally and globally sustainable Finland" has been revised and adopted in December 2013. Along with the revision of the strategy, a national concept **"Society's Commitment to Sustainability – The Finland we want by 2050"** has been launched. The Finnish National Commission on Sustainable Development is responsible for adapting international sustainable development goals into Finland's national policies and it will be carried out in line with the policies of the United Nations, the European Union, the Arctic Council and the Nordic Council of Ministers. Especially the conclusions reached at the UN's sustainable development follow-up conference (Rio+20) serve as an important framework for Finland's national sustainable development work.

In order to make the vision for 2050 a reality, Finland will focus on achieving 8 objectives of the commitment. One of them is:

Decision-making that respects nature

We will foster people's respect for biodiversity and raise their awareness of its importance, so that administration, municipalities, companies and citizens will consider it in their own decision-making and actions. The goal is to stop the loss of biodiversity by 2020.

Society's Commitment to Sustainability has been prepared by a wide-ranging strategy group. Through the commitment, the government and the administration, in collaboration with various societal actors, pledge to promote sustainable development in all their work and operations. For more information on the commitment see: <http://www.ym.fi/download/noname/%7BFE80DF3A-FEA3-4193-9FC2-F37B84D65CCE%7D/96164>

The results of the sustainable development work will be tracked through a national indicator programme.

Aichi target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems

National target 2: Biodiversity values have been internalised. Alternative indicators to GNP have been adopted to measure how well sustainable development objectives have been realised. The goal of conserving biodiversity has also been integrated into decision-making on plans, programmes and projects.



Finnish TEEB, national ecosystem indicator project and other projects are paving the way for incorporating ecosystem services into national accounting.

The adoption of the **Strategic Plan for Biodiversity 2011–2020 and the Aichi Targets** are important tools for integrating ecosystem services into the work on national and regional levels. Finland has adopted both a new Biodiversity Strategy (2012) and Action Plan (2013), in line with the Nagoya decisions in 2010. Target 39 of the Action Plan requests the Ministry of the Environment, together with the Ministry of Agriculture and Forestry, to: “Identify and assess the status of ecosystems and ecosystem services in Finland, in line with the EU Biodiversity Strategy.” Objectives and measures for EU Member States are included in the EU Biodiversity Strategy from 2011. Action 5 calls on “Member States, with the assistance of the Commission, to map and assess the state of ecosystems and their services in their national territory by 2014, assess the economic value of such services and promote the integration of these values into accounting and reporting systems at EU and national level by 2020”.

The national work ongoing in Finland aims at having concrete results in 2014 on the assessment of the main values of ecosystem services, for instance, efforts underway are a project on identifying harmful subsidies and the work under the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). In EU Member States, country-specific case studies are under preparation, and the actual mapping of country ecosystems and services will be done by countries on a volunteer basis. The integration of maps at EU, national and regional scales will be explored. Additionally, the work will continue on evaluating biodiversity data through an EU scanning exercise, on assessing the Convention on Biological Diversity, on EU and national reporting on biodiversity, and on the relationship between species, ecosystems and services.

In addition to the primary objective of **Finland's Government-approved Development Policy Programme (2012)** — the elimination of poverty — development policy also assists in finding solutions to other global challenges, such as the unsustainable use of natural resources and climate change. One of the four priorities of the programme is the sustainable management of natural resources and the achievement of environmental protection inter alia by supporting the conservation of biological diversity locally, nationally and globally as well as

ensuring the rights of local communities; emphasising the position and specific needs of developing countries and in particular the position of women in negotiations on environmental agreements and when implementing the decisions; reinforcing indigenous peoples' right to use natural resources; promoting sustainable management and use of natural resources, such as forests; and developing good environmental legislation and governance.

In this context, the programme states, for instance, that the implementation of the Rio conventions on biodiversity, climate change and desertification has clear development impacts and interlinkages, and synergistic solutions should be sought. Through development policy and cooperation Finland supports protection of environment and biodiversity as well as promotes sustainable use of natural resources. The aim is that basic preconditions for life are preserved for future generations. Impoverishment of nature has serious economic and social consequences, and the overthrowing of nature's balance is a threat also to human well-being.

Finland's development cooperation takes also into account the objectives and obligations of environmental conventions. Finland's development cooperation in the environmental sector must promote the objectives and measures of biodiversity protection, its management and sustainable use, in ways that are systematic and cost-efficient and by supporting the capabilities of developing countries. Aspects related to biodiversity and ecosystem services will also be highlighted in bilateral relations with developing countries, as appropriate.

Target 100 of the Action Plan requests "as part of the implementation of the Development Policy Programme and by taking the equality perspective into account, that Finland seeks to support development cooperation projects aimed at reducing poverty in developing countries, through the conservation and sustainable use of biodiversity, and with the objective of safeguarding and strengthening ecosystem services. In addition, Finland seeks to promote opportunities for young experts to participate in development cooperation projects and programmes under this theme".

In terms of valuing biodiversity and ecosystem services, we still need to promote the wider use of tools and approaches as well as successful combination of different ecosystem services. There are two key aspects: awareness-raising and general communication, and the carrying out of work with a broad range of stakeholders that have an impact on natural resources.

Finnish Government has given a Forest Policy Report to the Parliament in February 2014. The report steers the use of Finnish forests until the year 2050. The vision is growing welfare that stresses the diverse welfare derived from forests and the fact that the utilisation of forests offers solutions to the needs of the people and society. The Forest Policy Report presents three strategic objectives: 1) Finland is a competitive operating environment for forest-based business, 2) Forest-based business and activities and their structures are renewed and diversified, and 3) Forests are in active, sustainable and diverse use. Among the most important sets of measures the aim is to secure the biodiversity of forest nature, ecosystem services and ecological and social sustainability of forests. The measures therein include developing nature management in commercial forests as a part of sustainable forest management, developing voluntary means and market mechanisms for protection and developing the representativeness, coverage and good management of the network of protection areas. The Forest Policy Report, together with the report of the Finnish Parliament, steer the preparation of the Finnish Forest Strategy 2025 – our next National Forest Programme – which will be drafted during 2014.

Finland's National Forest Programme 2015 (NFP 2015) was adopted as a Government Resolution in 2010. The mission of the programme is to generate increased welfare through diverse and sustainable forest management. The vision presented in the programme is 2020, by which the aim is that the Finnish forest sector is a responsible bio-economy, forest-based livelihoods are competitive and profitable, and forest biodiversity and other environmental benefits have been strengthened. One of the three objectives of the NFP 2015 is strengthening forest biodiversity, environmental benefits, and welfare implications. As regards biodiversity, the objective is to halt the decline of forest habitat types and species and to establish a favourable trend in the state of biodiversity. The actions include for example implementing the measures laid down in the METSO programme and improving habitat management in commercial forests.

Aichi target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

National target 3: Incentives and subsidies harmful to biodiversity have been identified and reformed, and economic controls related to biodiversity have been enhanced, taking into account national socioeconomic and cultural conditions.



Finland has carried out an extensive survey of environmentally **harmful subsidies** (<http://valtioneuvosto.fi/ajankohtaista/tiedotteet/tiedote/fi.jsp?oid=386980>) and is in the process of considering next steps. This survey will be complemented with a report addressing subsidies considered harmful to biodiversity. A national broad based working group was established 20 November 2013 to work on harmful incentives and resource mobilization issues.

The Forest Biodiversity Programme METSO 2008–2020 aims to halt the ongoing decline in the biodiversity of forest habitats and species, and establish stable favorable trends in Southern Finland’s forest ecosystems. The objective of the programme is to ensure that Finnish forests will continue to provide suitable habitats for endangered and declining species. METSO-programme is also an example of payment of ecosystem services (PES). The METSO Programme covers both private and state-owned lands. It is a collaborative effort between the Ministry of the Environment, the Ministry of Agriculture and Forestry and other stakeholders. The voluntary approach of METSO is highly valued by forest owners and the possibility to retain their property rights.

The Finnish Government funds the METSO programme approx. 38 MEUR/year, which allows it to deliver annual yields of about 7 500 hectares of permanently protected areas, with temporary agreements signed to protect 6 000 hectares a year. Biodiversity values of key biotopes in commercially managed forests are enhanced by nature management of about 1 500 hectares a year.

Finland’s **Agri-environmental scheme** supports the conservation and sustainable use of biodiversity by providing positive incentives to the farmers. In particular, two voluntary special support forms – traditional biotopes and other measures to enhance biodiversity – have had positive impacts on biodiversity.

Aichi target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

National target 4: Administration, business, civil society and stakeholders at all levels promote and implement plans for sustainable production and consumption, and keep the impacts of natural resource use within safe ecological limits.



The Programme to Promote Sustainable Consumption and Production, “Getting more from less”, (2005) was revised in 2013. The revised programme, “**More from Less – Wisely**” aims to reduce the environmental impacts and greenhouse gas emissions of households and the public sector. It proposes that the state and municipalities set an example by creating the preconditions for more-sustainable solutions. To support the attainment of these objectives, funding will be provided for eight projects testing eco-efficient solutions related to mobility, housing and food. This will also create new jobs in, and opportunities for, the green economy. More information: http://www.ym.fi/en-US/The_environment/Sustainable_consumption_and_production ; Brochure: <http://www.ym.fi/download/noname/%7B11E6BCBF-402F-4338-848A-A6F7676D0ADD%7D/58318>

The **material efficiency programme** was adopted in January 2014 (Ministry of Employment and the Economy, 2014): promotes material-efficient production and businesses. More information: http://www.tem.fi/yrikykset/tiedotteet_yrikykset?89508_m=113129 [in Finnish]

One of the actions undertaken under the programme involved the establishment of a material-efficiency centre in Finland. Numerous studies have been conducted which evaluate the environmental impacts of material flows within the national economy, with illustrative tools being developed as a basis for assessing the environmental impacts of individual decisions.

Tekes **Green Growth research programme (2012–2015)**. The aim of the Green Growth programme is to identify potential new growth areas for the sustainable economy business, which are essentially based on lower energy consumption and sustainable use of natural resources. More information: <http://www.tekes.fi/en/programmes-and-services/tekes-edistaa-yhteistyota-ohjelmien-avulla/green-growth/>

Sustainable consumption and production (SCP) has been recognized as one of the most important new thematic areas in the SDG- Post-15 discussions. For Finland, the shift to SCP has universal relevance. For countries with high material consumption, it means resource- and energy-efficiency in production and adoption of more sustainable lifestyles. We need to build our efforts on the 10-Year Framework of Programmes on SCP, adopted in Rio+20, which provides us with a feasible global framework of action, recognising all dimensions of sustainable development.

The Mining Act of 1965 has been completely revised and the **new Mining Act** entered into force in July 2011. The mining duties was transferred from the Ministry of Employment and the Economy to the Finnish Safety and Chemicals Agency (Tukes), with certain exceptions. The objective of the new Act is to safeguard mining and ore prospecting in a socially, economically and ecologically sustainable manner. Under the Act, permit consideration is based on a comprehensive survey, taking account not only of the requirements of ore prospecting and mining, but also other factors such as the environmental impacts of operations, impacts on the landscape, land use and safety (incl. sparing use of natural resources, nature conservation and the reconciliation of the different needs for use of areas). Additionally, possible restrictions in other legislation, such as the Nature Conservation Act, should be taken into account when granting permits. Environmental permits for mining are determined under a permit procedure in accordance with the Environmental Protection Act.

Business and Biodiversity Finland seeks to create public awareness and offers information about best practices concerning biodiversity management as well as tools for companies to implement in their own operations. The B@B network help companies to identify and manage their own impacts on nature. The initiative encourages companies to integrate biodiversity and ecosystem services in all environmental and sustainability management systems and practices. The programme is executed by FIBS in cooperation with the Ministry of Environment. (More information: <http://www.fibsry.fi/fi/fibs25-en>)

Finnish forest companies have provided a part of their own forests to permanent protection under Nature Conservation Act as well as METSO programme.

Aichi target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

National target 5: The loss of all natural habitats has been halted, and the degradation and fragmentation of natural habitats have been significantly reduced.



Assessment of threatened habitat types. Finland has invested in the development of the IUCN Red List of Ecosystems assessment method. The method was first introduced in September 2012, at the IUCN world congress in South Korea, and the development work will continue (Consolidation of the IUCN Red List of Ecosystems; <http://portals.iucn.org/docs/2012congress/motions/en/M-072-2012-EN.pdf>).

Finland also participates in the European Commission project, Establishment of a European Red List of Habitats, which will be implemented in 2014–2016. Furthermore, preparations are being made for the next round of assessments of threatened habitat types in Finland.

Aichi target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

National target 6: All aquatic biotic resources are managed and utilised sustainably, applying an ecosystem-based approach. The concept of maximum sustainable yield (MSY) is applied in fisheries. Living natural resources are utilised within safe ecological limits.

Fish stock management plans are drafted for all threatened fish populations and where necessary for commercially fished populations and groups of populations. Fisheries have no significant adverse impacts on threatened species or vulnerable ecosystems. Fish migration routes and spawning areas are safeguarded in waters of importance to migratory fish and commercially fished species. Depleted fish stocks are strengthened and native fish populations restored with the help of introductions.



Government resolution on national **Fish Passage Strategy** was accepted in 2012. The purpose of the strategy and the priority axes proposed in it is to promote measures to reinforce, in particular, the natural reproduction of the threatened migratory fish stocks. Reaching the objectives requires a set of instruments comprised of several measures, depending on the specific watercourse and fish stock, with fish passages as one of the main elements. Perspectives relating to, for example, regulation of fishing, weak status of the original spawning areas and changes to the mandatory stocking may, however, cause difficulties to natural reproduction. The Fish Passage Strategy also aims to clarify the issues relating to the assessment of the need for fish passages and the selection of sites, support and improve cooperation to promote the projects and promote the implementation of other support measures concerning the recovery of migratory fish stocks as part of the fish passage solutions.

The aim of the **Fishing Act reform** is to promote the natural reproduction of fish and to create a new regulation system for the sustainable use and management of fish stock that is based on information. In addition, the new act will simplify the fishing permit system, strengthen regional participation, clarify the roles of the different

actors and increase cooperation between them. Regulation is proposed as the most important tool for fish stock management. The following new means of regulation are proposed to be included in the act, among others:

- adipose fin clipping of salmonoid and the related fish release requirement,
- introducing a maximum landing size for fish,
- approving the maximum sustainable yield and the amount of traps allowed, and
- banning the sale of fish caught by anyone other than professional fishermen

Efforts are being made to enhance the protection of depleted and threatened fish stock, in particular. The regulation of fishing would be based on regional and national management plans. The regulation would be put into effect by decrees and by the administrative decisions of the Centres for Economic Development, Transport and the Environment.

The government bill will be introduced to Parliament in spring 2014. The reformed Fishing Act is expected to enter into force at the beginning of 2015.

The **national salmon and sea trout strategy** will be submitted to the Government for approval in 2014. The most important goal of the strategy is to revitalise the salmon and sea trout stocks. One of the central requirements of the strategy concerns the adipose fin clipping of all salmon and sea trouts that are planted at the age of one year or older. The strategy includes a proposal for a minimum target for the production of migratory young salmon in Tornionjoki and Simojoki. In addition to this, the strategy proposes introducing salmon quotas for fishermen and extending the salmon fishing period to last for the whole the season. Further aims include the reduction of mixed-population fishing that does not differentiate between weak and strong fish stocks. More restrictions will be imposed on the fishing of sea trout. The intention is to prohibit the targeted and deliberate fishing of sea trout and to allow lure fishing only in areas where adipose fin clipped young sea trout are planted.

Aichi target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

National target 7: Practically identical.



The **amended Forest Act** entered into force on 1 January 2014. The amended Forest Act increased the area of designated habitats of special importance whose special characteristics should be preserved. Before the amendment the total area of registered habitats of special importance was about 177,000 hectares and by the amendment this was increased by estimated tens of thousands of hectares. The Forest Act also allows planned and coordinated nature management and restoration measures for reinforcing the important characteristics of these habitats. Besides the habitats covered so far the habitats of special importance to be protected under the Forest Act now include hardwood swamps with wood horsetail, cloudberry and springs, as well as fens in the region of Lapland. Of these, for example, hardwood swamps with wood horsetail have been evaluated as endangered in the assessment of threatened habitat types in Finland 2008.

Biodiversity will be further enhanced by more accurate specification of the scope of application and abolition of the regeneration obligation under the Forest Act for drained peatland forests with low productivity, semi-natural habitats to be restored, and mire areas which used to be open. The growing of mixed stands is promoted by allowing a broader range of tree species in forest regeneration. The Finnish Forest Research Institute estimates

that the abolition of the regeneration obligation for drained peatland forests with low productivity makes it possible to restore about 550 000 hectares of original mire habitats.

In the amended Forest Act there are no restrictions relating to the age or thickness in regeneration felling, which means that in commercial forests the rotation period is decided by the forest owner. According to estimates by experts, this has no major impact on the age class distribution of forests or the share of old-growth forests.

The forest management recommendations were updated in the context of the reform of the Forest Act. The update was completed at the end of 2013. The recommendations were prepared from the perspective of forest owners and their diverging objectives so that they provide the forest owners with alternatives to be chosen according to their objectives and values. The recommendations are also a tool for the authorities, officials, entrepreneurs and employees in their advisory work and in marketing their services. The recommendations were developed with the aim that it is easier for the users to find the means to secure and enhance biodiversity in all the alternative ways of forest treatment. Relating to this, recommendations are now given, for example, on forest treatment focused on game animals. Forest management recommendations for the harvesting and growing of energy wood were published in 2010.

In addition to Forest Act the Act on the Financing of Sustainable Forestry provides tools to safeguard biodiversity.

There are two voluntary forest certification schemes in operation in Finland:

FSC (Forest Stewardship Council) promotes responsible forestry and the first national standard came into force in spring 2011. So far, a bit less than 500 000 hectares of forests have been certified <http://fi.fsc.org/index.htm> (in Finnish), predominantly by forest-based industry companies as well as private forest owners under group certification of the companies. The regulations regarding management and use are revised at five-year intervals in the standard development group under Forest Stewardship Council Finland (in Finnish).

PEFC (Programme for the Endorsement of Forest Certification schemes) promotes ecologically, socially and economically sustainable forestry throughout the world. The PEFC system includes requirements for forest management and use, verification of origin of wood raw material, as well as for the independence and competence of the auditors. The regulations regarding management and use are revised at five-year intervals. The Finnish PEFC standards are now under revision. The Finnish PEFC system is maintained and developed by PEFC Finland – Finnish Forest Certification Council. The rules of the council can be found here (in Finnish). Approximately 20.7 million hectares of Finnish production forests are certified under the Finnish PEFC system. The Finnish system was endorsed for membership of PEFC in the year 2000. Ecological sustainability criteria take into account biodiversity widely e.g. by preserving typical forest habitats and ensuring species survival. For example, as a result of PEFC certification the number of retention trees at clear felling sites has increased being nowadays about ten per hectare.

Nature management in commercial forests contributes to securing ecological sustainability in the use of forests, as well as promoting diverse use of forests, landscape management and water protection, and maintaining cultural heritage relating to forests. The Finnish Forestry Centre monitors the standard of nature management and conducts annual assessments of the state of the nature in commercial forests. Most of the fellings assessed are clear-cuttings and fellings involving natural regeneration. A nature management expert conducts a field visit to assess how nature management has been taken into account in the planning and implementation of felling operations. The assessment is based on the recommendations for nature management and information is collected, among other things, on the presence of valuable nature sites and preserving these in fellings, volume and type of growing stock preserved for biodiversity purposes, standard of water protection and landscape management, and costs of nature management. The results from the assessment are utilised in the annual group certification operations. The sites for the assessment are selected by both targeted and random sampling. The purpose of random sampling is to make sure that the areas are comparable with each other, while targeted

sampling is used in order that that the sites covered by the assessment also include observations on the preservation of valuable habitat sites. Among the important elements in this work is the assessment of the preservation of different kinds of nature sites, including wooded habitats, sites covered by the Forest Act, and other nature sites. The results of the assessment are delivered as feedback to those implementing and planning the fellings and to landowners.

In 2011 the forestry actors introduced a national operating model for the transfer of information on threatened species and its use in forestry. By the model the information compiled by the environmental organisations is made available for use by forest organisations. The model gives instructions on how data on the occurrence of threatened species can be taken into account in forestry planning and implementation. Information has also been produced on species recognition, habitat requirements and treatment recommendations. The landowners and actors in the forest sector have access to the presentations of the species to be used in forest planning and advice and implementation of forest treatments.

In 2012, the Finnish Government approved a **resolution on the sustainable and responsible use and protection of mires and peatlands**. The decision directs new land use that would significantly alter mires to peatlands that have been drained or whose natural state has otherwise been significantly changed. It is also used to implement sectoral policies and measures for sustainable use, and it is used to improve the status of the existing network of protected peatlands. As a part of the resolution, a long-term peatland protection and restoration programme will be carried out by 2025.

The resolution defines the objectives and measures relating to the sustainable and responsible use of mires and peatlands. Sustainable and responsible use reconciles the different objectives of the use of mires and peatlands so that a significant social, economic and ecological benefit can be derived from their use. The objective is to secure the benefits and energy supply from agriculture and forestry, reduce the harmful impacts of the use of mires on waters and climate, enhance a favourable conservation status for mire nature and promote the multiple use and cultural services.

The sustainable and responsible use of mires and peatlands is reconciled by directing activities which significantly change the mires to such mires and peatlands which have been drained or whose natural state has otherwise been significantly altered as well as by implementing sector specific strategies and measures to promote sustainable and responsible use.

The **National aquaculture spatial plan** will be completed in 2014. The aim of spatial planning is to minimise the load of aquaculture in areas that are environmentally and recreationally vulnerable. The production is allocated to areas with better tolerance of emissions. The aim of spatial planning is to move the production to the outskirts of the water systems, which would also reduce the conflicts between other water system uses, such as leisure housing, recreational use and nature conservation. Furthermore, centralising the small units of one company increases the profitability of aquaculture and minimises its carbon footprint.

The proposal for the new guidelines for environmental protection in fish farming was completed in 2013. The guidelines for environmental protection in fish farming are general guidelines on best practices in fish farming for ensuring environmental protection. The objective of the guidelines is to streamline the authorities' operations and monitoring. In Finland, the starting point for the development of fish farming is the reconciliation of business and environmental policies. Aquaculture production will increase in Finland in the future. The aim is to create the prerequisites required for an ecologically and economically sustainable increase of production.

<http://www.ym.fi/download/noname/%7BE7852D64-F250-49CF-9AFA-1A18547CB62E%7D/52538>

Aichi target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

National target 8: Practically identical.



The general objectives of water protection have been defined in the Finnish Government decision-in-principle on Water Protection Policy Outlines to 2015, which was adopted by the Government on 23 November 2006. It includes objectives and actions to reduce the nutrient loads that cause eutrophication, to reduce the risks caused by hazardous substances, to protect groundwater bodies, to protect aquatic biodiversity and to restore ecologically damaged water bodies

The objectives set in the Act on Water Resources Management (1299/2004), based on the Water Framework Directive 2000/60/EC, states that surface waters and groundwater shall be protected, enhanced and restored so that the water status objectives can be reached by 2015 at the latest. The objectives are determined in connection with water management plans and related programs of measures and seek to ensure no deterioration in the status of surface waters and groundwater, which should be of at least good status. The Government adopted the River Basin management Plans until 2015 in the end of 2009. These plans will be reviewed so that the Plans until 2021 will be adopted by the Government in the end of 2015.

The 2013 ecological assessment of surface waters accords a good or high status to 85% of the surface area of Finnish lakes, and 65% of rivers. Only a quarter of coastal waters achieved the same status.

Point sources, such as industry and municipal wastewater treatment plants, have succeeded in considerably reducing the flow of nutrients into water bodies since the 1980s. In 2000–2010, the combined discharge of phosphorus from industry, communities and fish farming fell by 33% and nitrogen by 16% respectively. This success has been achieved by improving industrial processes and by boosting industrial and communal wastewater treatment. No such significant reductions have been achieved in relation to sources of diffuse pollution, and agriculture has become the most important source of nutrients in aquatic environments. The key goal of the 2006 Government Decision in Principle on Water Protection Policy Guidelines until 2015 is to reduce the flow of eutrophication-inducing substances into water bodies. The programme does not define quantitative targets for point sources, but encourages the agricultural sector to decrease its nutrient run-off by at least one third from the average level of 2001–2005 (SYKE Publications 1, State of the environment in Finland 2013) <https://helda.helsinki.fi/handle/10138/42691>

The vast majority of the Baltic Sea is still affected by eutrophication, indicates the eutrophication assessment for 2007–2011. <http://www.helcom.fi/Lists/Publications/BSEP143.pdf>

Overall inputs of nutrients have decreased since the inception of the Action Plan, by 9% for nitrogen (N) and 10% for phosphorus (P) comparing to the BSAP baseline years (1997–2003). In the longer time perspective, since 1994, the reductions have been even larger –inputs of N and P to the Baltic Sea have been cut by 18% and 16%, respectively.

New targets for nutrient input reductions and maximum allowable inputs and reduction targets for HELCOM countries were adopted by HELCOM Contracting Parties, in 2013 by Ministerial Meeting. The targets will set the overall direction for regional actions for a healthier marine environment of the Baltic Sea.

Aichi target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

National target 9: Practically identical.



Finland's National Strategy on Invasive Alien Species was completed in April 2012. The purpose of the strategy is to prevent damages and risks caused by invasive alien species (IAS) to the Finnish nature, sustainable use of natural resources, livelihoods and well-being of the society and people. The strategy was adopted by a Government Resolution on 15 March 2012. The proposal for Finland's National Strategy on Invasive Alien Species was prepared in collaboration between a broadly-based working group and experts, involving a total of more than 100 people. The objective of Finland's National Strategy on Invasive Alien Species is to minimize the threat and damage caused by invasive alien species, both those already present in Finland and the potential ones. The aim is to take action at the earliest stage possible to combat invasive alien species, because this is the most effective and far less costly approach to prevent damages caused by IAS. (For more information 2.3 Recent actions and examples.)

The research project entitled Increasing knowledge on invasive alien species (IAS) in Finland – distribution, dispersal, risk management, pathways for entry (HAVINA) analysed the dispersion of invasive alien species and the extent of harm in Finland in **2012–2013**, as well as the main pathways for entry within, to, and from Finland. During the project, information on the best practices for managing the existing alien species in Finland were collected and the cost-efficiency of the practices evaluated. The project also included creating a cost evaluation model for the management options, and investigating potential new funding mechanisms and sources that could be used for controlling alien species in Finland and for eliminating the related risks. Furthermore, the research project generated information on aquatic animals, mammals, ornamental plants, and plant pests for risk assessment purposes. The aim of the HAVINA project (Increasing knowledge on invasive alien species (IAS) in Finland – distribution, dispersal, risk management, pathways for entry) was to promote the exchange of information and to support the implementation of the national strategy for alien species in Finland.

The seven Finnish research institutions, agencies, and organisations collaborated within the project to create a **national web-portal of invasive alien species** www.vieraslaajit.fi, which will be launched by summer 2014. The portal gathers information on invasive alien species from across the country. The portal presents general information on alien species and their management options, and includes a species-specific search feature. The 102 species cards created during the project include information on each invasive alien species and its management, complemented with pictures, dispersion maps and a link to the reporting tool citizens can use to report their observations of invasive alien species.

The Ministry of Agriculture and Forestry has established the **Finnish Advisory Board for Invasive Alien Species**, which acts as the expert body on questions and policies concerning invasive alien species. One of the most important tasks of the Finnish Advisory Board for Invasive Alien Species is to coordinate and follow the implementation of the National Strategy on Invasive Alien Species. The advisory board follows the distribution and harmful impacts of invasive alien species and the effectiveness of preventive actions. In addition to this, the board gives proposals for the required measures, presents risk assessments and updates the national lists of invasive alien species.

The advisory board comprises a wide spectrum of members. The members include parties that research and monitor alien species and control the spreading of the species, such as authorities, research institutions, regional actors and associations. In addition to the president and vice president, the advisory board includes 21 other

members, their personal deputies and three expert secretaries. The advisory board also consults the expertise of the practical operators in various fields. The advisory board is appointed for five years.

The tasks of the advisory board are based on the Government resolution on the National Strategy on Invasive Alien Species from 15 March 2012.

Aichi target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

National target 10: The multiple anthropogenic pressures on threatened ecosystems impacted by climate change have been reduced so as to maintain their integrity and functioning.



Climate change adaptation strategy. The round of comments on the revised **National Strategy for Adaptation to Climate Change 2022** is currently underway. The strategy lists the central measures that will be taken to integrate climate change adaptation into climate-conscious planning and operations in the coming years. The strategy draft is available on the website of the Ministry of Agriculture and Forestry:

<http://www.mmm.fi/fi/index/ministerio/lausunnolla2.html>. The aim of the strategy is to build up Finland's capacity to control the risks related to climate change and adapt to changes in climate.

The fifth assessment report of the **Intergovernmental Panel on Climate Change (IPCC)** confirms that climate change as a result of human influence is taking effect (IPCC 2014). Adaptation is unavoidable, even if the amount of greenhouse gas emissions could be halted in the near future. According to the latest assessments, if greenhouse gas emissions remain at their current level, the Earth's average temperature may increase by 3–5 degrees by the end of the century. In Finland, the rise in temperature is estimated to be about 1.5–2 times greater than the average global change. In addition to the average temperature, climate change has an effect on daily maximum and minimum temperatures, rainfall, snowfall, the thermal growth season and other climate indicators.

The time span of the change affects the adaptation measures. Preparing for extreme weather conditions and water levels is a particularly important short-term measure. It is advisable to be prepared for at least rainstorms, floods, drought and hot weather, as evidenced by recent experiences. Extreme weather conditions are expected to become more frequent because of the warming climate, although it is impossible to tell for certain which individual weather phenomena are caused by climate change and which are instances of normal variation. In the long term, adaptation to the effects of average climate change and risk management will become increasingly important. The time span of land use planning, for instance, should be several decades into the future.

In the future, ecosystems will face an exceptionally rapid change compared to evolutionary change, which will threaten both habitats and species. Rapid changes hinder the ability of ecosystems to survive other stress factors and overcome disturbances. This could reduce their prerequisites for yielding benefits that are essential to humans. Climate change can also have effects that push the boundaries of adaptation. In northern areas, this is exemplified by the endangered status of northern ecosystems. Climate change is expected to particularly threaten ecosystem services that are based on natural diversity. Southern species spread north. Species that have adapted to winter struggle to survive, and some birds of the boreal forests or mires, such as the pine grosbeak and the jack snipe, face the risk of extinction in Finland. Cultivated species are also changing, and the global changes in food production will influence Finland.

Aichi target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

National target 11: Finland's network of protected areas and the measures applied to conserve biodiversity in the use of other areas together cover at least 17 per cent of the terrestrial environments and inland waters of the country, and 10 per cent of coastal and marine areas. The functionality and coverage of the network have particularly been improved in Southern Finland. Protected areas are suitably managed and ecologically and regionally representative. They are well connected, and green infrastructure also connects them to wider landscape entities, with regard to the special features of heritage landscapes. Biodiversity also continues to be safeguarded in commercially managed forests.



The National Action Plan 2013–2020 reassures that Finland aims to form a comprehensive, effectively managed, ecologically functional and representative protected area network that is part of the global protected area system and that can buffer effects of climate change and can adapt to it. Finland's protected area network is comprised of national and regional protected area systems. At the moment, there is no separate national vision, nor comprehensive development targets for protected areas.

The national park system has been assessed in many ways since 2010. Two new national parks were established in 2011: Sipoonkorpi National Park (covers 19 km²) and Bothnian Sea National Park (covers 912 km² of which 98% is marine). Two new national parks have been proposed in 2013, one on the coast and another protecting a lake area in central Finland. The coastal and marine national parks network is being evaluated in 2014.

Indicator 1. Protected area coverage

An estimated 12.5% of Finland's total surface area of about 340 000 km² (excluding marine areas) is now under protection, counting statutorily established nature reserves and other protected areas (Table 1). When other areas reserved for nature conservation programmes are also counted, including European Union Natura 2000 network sites, the total area under protection increases to nearly 15%. Furthermore, there are several other measures applied to conserve biodiversity. For example, in forests these other measures, such as habitat types protected under the Nature Conservation Act and habitats of special importance as defined in the Forest Act, comprise approximately 3% of Finland's total surface area (31.12.2008). Thus, the total area under protection and other measures applied to conserve biodiversity is at least 18% of Finland's total surface area. In addition, there are similar measures applied to conserve biodiversity in other ecosystem types as well, such as management of traditional agricultural habitats, aquatic habitat types protected by Water Act and national urban parks. However, the area of these measures is not exactly known.

Table 1. Protected area number and area in Finland 31.12.2013 (Private protected areas 31.12.2012).

Protected area type	Number	Area (ha)
National parks	37	980 697
Strict Nature Reserves	19	153 492
Mire Reserves	171	461 989
Old-growth Forest Reserves	91	9 801
Herb-rich Forest Reserves	51	1 169
Other state-owned Nature Reserves	69	67 523
Total state-owned Nature Reserves	438	1 674 671
Private Nature Reserves (135 sites, 8449 ha state-owned)	10 397	288 456
Total statutory nature reserves	10 835	1 963 127
Areas reserved for nature protection (designated in Nature Conservation Programmes and Regional Land Use Plans etc)	2 359	795 524
Wilderness Reserves	12	1 489 114
TOTAL PROTECTED AREAS	13 206	4 247 765

Source: Metsähallitus Natural Heritage Services.

There are about 12% of Finland's terrestrial areas in the **Natura 2000 network** (Natura 2000 barometer 2013) and 19% of the inland waters. According to a recent HELCOM status report (2013) on the Baltic Sea marine protected areas 10% of Finland's marine area is protected in the Baltic Sea Protected Area (BSPA) network (7% if the EEZ is included). Establishment of Natura 2000 protected areas has complimented the existing national network and notably increased the protection of still inadequately protected marine habitats and inland waters. About 13% of Finland's marine areas is protected when the new marine Natura 2000 areas are taken into account. Five new marine Natura 2000 sites were proposed in 2012. These are awaiting approval and will extend the BSPA network. 11 new Ramsar sites have been proposed but not yet designated.

National *Guidelines for applying the IUCN Protected Area management categories in Finland* were approved in 2013 as one of the first countries in Europe; classification of established State-owned PAs has been completed in March 2014. The data on protected areas has been updated in the UNEP-WCMC database on PAs.

Biodiversity continues to be safeguarded in commercially managed forests for example by means of Forest Act, forest certification schemes and the METSO programme (see e.g. 2.3 Recent actions and examples and 3.1 Progress towards Aichi Biodiversity Targets, Target 7).

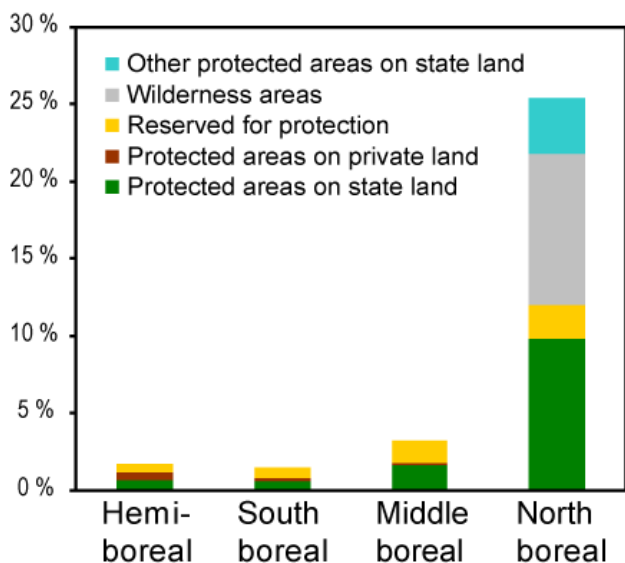
Indicator 2. Protected area coverage of biodiversity

The majority of protected areas are situated in northern Finland. The percentages of protected forest, mire and alpine habitats are shown in Figure X. Similar Indicators are under development for marine areas, inland waters, shores and rocky habitats, as well as urban areas (city municipalities). These will be included in the www.biodiversity.fi indicator scheme.

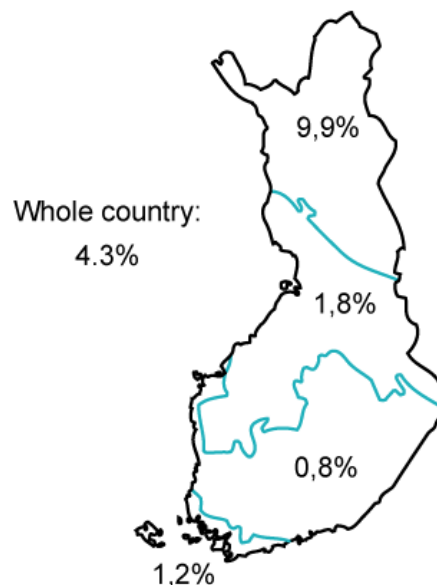
The network of protected areas still needs further development when it comes to geographical distribution, connectivity and representativeness. Greatest challenges are in southern Finland, where habitats are fragmented and land use pressures much greater than in the north. This is also clearly indicated by the First Assessment of Threatened Habitat types in Finland (Raunio *et al.* 2008). An action plan for improving the state of threatened habitat types was approved in 2011 – this includes measures for habitat site protection, restoration and management. The latest Red List of Finnish Species was completed in 2010. An action plan for prioritized measures is being drawn up and implementation ongoing. Measures include habitat site protection and management.

A gap analysis of the ecological representativeness of the network is planned as part of the national development plan for the protected area system (NBSAP 2012–2020).

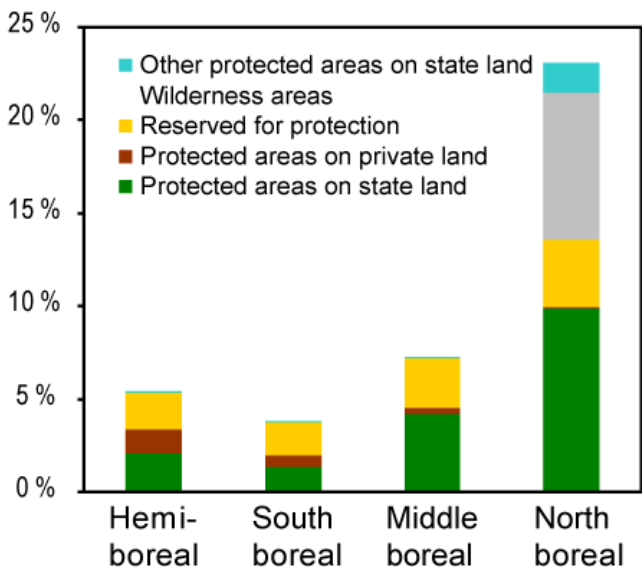
A) Protected forests



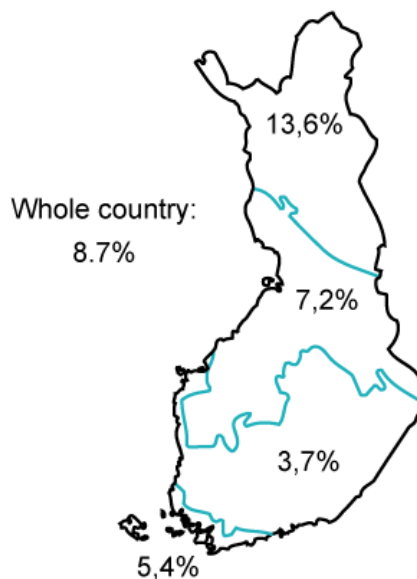
B) Strictly protected forests



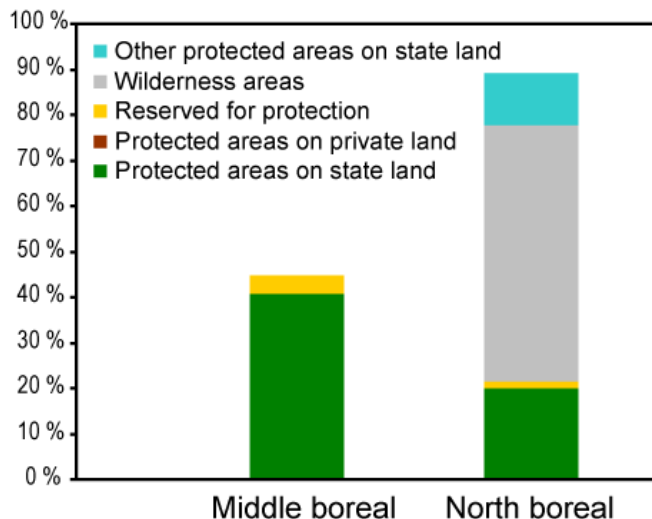
A) Protected mires



B) Strictly protected mires



A) Protected alpine areas



B) Strictly protected alpine areas

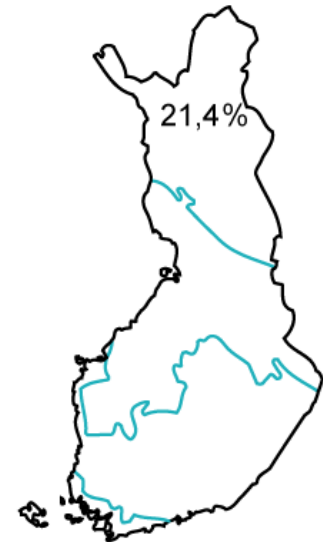


Figure 29. Percentage of protected forests, mires and alpine areas and protected area types in the hemiboreal and boreal forest zones of Finland. Source: Metsähallitus Natural Heritage Services.

The functionality and coverage of the network have particularly been improved in Southern Finland.

The Forest Biodiversity Programme METSO 2008–2016 aims to halt the ongoing decline in the biodiversity of forest habitats and species, and establish stable favourable trends in Southern Finland’s forest ecosystems. The objective of the programme is to ensure that Finnish forests will continue to provide suitable habitats for endangered and declining species. The programme aims to establish about 96 000 ha of new protected areas by 2020; this would be about 0.3 % of Finland’s surface area. Between 2009 and 2013 a total of 15 000 ha of METSO sites have been protected voluntarily on private lands (by compensation to land owners) and another 12 000 ha purchased for the state. Over 10 000 hectares of state-owned forestry land was designated as conservation areas. Another 13 000 hectares of state forestry land and 7 000 hectares from other public ownership such as municipalities will be conserved. Over 13 000 ha of forests and mires in PAs have been restored and continuous management of wooded traditional agricultural habitats increased. Another aim in the METSO programme is to safeguard biodiversity by measures funded under the Act on the Financing of Sustainable Forestry by 82,000 hectares, i.e. about 0.2% of Finland’s surface area. These measures covered more than 32 000 hectares between 2008 and 2013.

As part of the National Strategy for Mires and Peatlands, a new nature conservation programme for mire protection is being drafted by the end of 2014, enhancing especially the network in southern Finland. The preliminary plan for the total area of the programme is 100 000 hectares.

Protected areas are suitably managed.

Over 90% of the network is owned by the state and is managed by the Metsähallitus Natural Heritage Services, working as a nationwide organization divided into three regional units. The *Guidelines for the management of protected areas* were updated in 2009 and again in 2013. Also guidelines and GIS databases for management planning have been developed 2009–2013. New management plans have been approved for over 100 Natura 2000 sites 2009–2013, area coverage of statutory management plans is over 80%. Participatory planning methods have been developed using new internet technologies for example.

Indicator 3. Management effectiveness

Management effectiveness of all 35 national parks was evaluated in 2010. Natura 2000 site condition assessment of over 100 sites has been conducted since 2010, including all 37 national parks. Coverage is now about 40% of the Natura 2000 network area and the aim is to have complete coverage by 2018. A PA system level management effectiveness evaluation is planned in 2015.

Indicator 4. Governance

At present 6–7% of the national PA network is privately owned (over 10 000 sites), and management is coordinated by the regional environment administration (ELY). More private nature reserves and other protected areas are still being established and cooperative management systems with Metsähallitus Natural Heritage Services and landowners are being developed.

Application of Akwé: Kon guidelines in management planning process of the Wilderness Reserves was piloted by the NHS and stakeholders (first time globally), and the decision made subsequently in 2013 to apply guidelines in all management planning in the Saami homeland area.

Indicator 5. Financing

Financing of the PA network through the state budget has remained stable. Financial sustainability is also ensured in the proposed national budget for 2015-2018, though cuts to the present level are foreseen. Finland has been very successful in competition for EU funds and several LIFE projects have been nominated Best Projects of the year. A new EU financial period has begun in 2014 – changes in the programmes and procedures have been taken into account, preparations for new projects are under way.

Indicator 6. Connectivity and integration

Comprehensive assessment of PA connectivity has not yet been done at national level. However, analysis of subnational networks is included in natural resource planning (NRP) of state lands and regional land use as well as in general PA planning. All seven large-scale NRPs have been updated in 2007–2013, and include landscape ecological plans which strengthen the green infrastructure around core protected areas. State-owned protected area networks have also been extensively analyzed with sophisticated conservation planning software (Zonation) to find effective conservation spots, especially in surrounding state commercial forests.

Legislation on Metsähallitus places a special obligation to protect biological diversity on state lands. Besides wood supply, ecological values in commercially managed forests are secured with environmental management standards. Valuable habitats are excluded from commercial forestry and are linked by ecological corridors and stepping stones. The ecological network includes various buffer zones such as environmentally valuable forests and biodiversity enhancement areas. Recreational and landscape sites also support the green infrastructure.

Implementation of the **EU Water Framework Directive and Marine Strategy Directive** has progressed in accordance with statutory actions and targets. This includes river basin management planning and development of marine spatial planning. Nature conservation objectives have been integrated within the water protection strategies. Evaluation and development of other sector legislation (environmental protection, forestry, fishery, mining, construction and land use) has been active in 2009–2013. Amendments of the Nature Conservation Act have simplified enlargement and establishment of protected areas.

Information on successful regional work with the aim of implementing CBD/PoWPA in the Barents region (<https://helda.helsinki.fi/handle/10138/42261>). This work has been done by using the amended PoWPA reporting

framework, and it has been a useful exercise conducted by the North-West Russian, Swedish, Norwegian and Finnish PA-experts from national and regional governments as well as from NGOs and scientific institutions.

The Green Belt of Fennoscandia will be developed into a model area where conservation and sustainable use of biodiversity are supported through transboundary cooperation between Finland, Russia and Norway. The Green Belt extends from the Baltic Sea to the Arctic Ocean, and includes valuable natural areas belonging to Finland, Russia and Norway. Its core is formed of national parks and protected areas on the territories of all three nations. The three signatories of the Memorandum of Understanding (2010) on the development of the cooperation will apply the objectives of the Convention on Biological Diversity, for example, as concerns the mainstreaming of biodiversity across government and society and sustaining the ecosystem services. In 2014 the Ministry of the Environment has appointed a national working group to promote the development of the Green Belt in Finland. The tasks of the working group include raising awareness of the Green Belt and its values in Finland and supporting the networking taking place across national boundaries.

Additionally, the Finnish Environment Institute has prepared a study on Green Infrastructure and its application in Finland.

The **Finnish Inventory Programme for Marine Underwater Environment VELMU (2011–2015)** has collected biodiversity data on species, communities and habitats since 2004. The goal of the programme is to create a knowledge basis for conservation of underwater environment, support sustainable use of marine resources, and aid in informed Maritime Spatial Planning.

In 2011 the inventory plan was revised and a new sampling scheme, consisting of ca. 17 000 observation sites, was set up, with the aim of producing data suitable for species and habitat modeling. The new data have been collected at different spatial scales and taxonomic levels with drop-video, ROV, scuba-diving and benthic and fish sampling on both soft and hard bottoms. In addition, new camera equipment and various remote sensing methods, such as satellite observation, LIDAR and aerial photography with UAV's, have been tested and developed.

VELMU data have recently been used in various academic studies and administrative assessments, such as reporting of the EU Habitats directive, as well as regional spatial planning in southern Finland. VELMU is planned to end in 2015. The main end products will be a database, a large number of species models and habitat maps, delivered through a GIS map service, and a Finnish Marine Atlas that contains all species and habitat information collected by VELMU.

Aichi target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

National target 12: Practically identical.



Preparation of a national action plan for species protection, in compliance with the 2012–2020 strategy and action plan for the conservation and sustainable use of biodiversity in Finland.

The aim is to prepare an action plan for the protection of threatened species. The goals of the plan include improving the cost-efficiency and effectiveness of species protection, ensuring long-term monitoring and research activities, managing species data, and securing the adequate organisation and management of volunteer work related to species protection. The action plan sets the focus points, resource targets and priorities of the

operations, as well as the schedules and distribution of tasks among the different parties. The action plan working group will be nominated in spring 2014, and its work is to be completed in 2015. A group of experts has drafted a list of species in need of urgent protection for the action plan, and measures have already been taken to protect them, based on regional priority discussions.

Aichi target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimising genetic erosion and safeguarding their genetic diversity.

National target 13: The genetic biodiversity of Finland's cultivated plants and their wild relatives, forest trees, fish stocks, and farmed and domesticated animals has been preserved and safeguarded.



MTT Agrifood Research Finland coordinates **national programmes for agricultural plant and domestic animal genetic resources**. The Finnish Forestry Research Institute conserves genetic resources of the forest trees.

The **Finnish National Programme for Plant Genetic Resources** has been acting ten years not (founded at 2003), and have an informative web pages: www.mtt.fi/kasvigeenivarat (in Finnish).

Country report for FAO of agricultural plant genetic resources was made in 2008. It summarized the situation of the seed and field collections, as well as the status of the duplicate preservation.

Collections consist of seed samples, field collections and cryopreservation.

- 1) Seed samples are stored at the NordGen, Nordig Genetic Resources Centre, located in Sweden. Base collections are in Denmark (Årslev), and duplicate collections in Svalbard Seed Vault. Accessions stored in the NordGen can be observed by the SESTO documentation system, which is freely accessible from the Nordgen web page (<http://www.nordgen.org/>)
- 2) Vegetatively propagated plants are maintained nationally as living plants in the field collections. They locate at the moment in MTT Piikkiö and Tuorla, Laukaa, Rovaniemi and Sotkamo, and in some horticultural schools.
- 3) Safety duplicates of some of the most disease sensitive vegetatively propagated plants are preserved in cryopreservation tanks in MTT Laukaa. These include plants like raspberries and black currants.

Collections include field crops; fruits and berries; vegetables, herbs and medicinary plants: and ornamentals. National, plant group based, expert groups are making decisions of selecting genotype for long term preservation.

During recent years, lot of activities has been carried out. DNA-marker technology has been used to discard duplicates and to maximize diversity in the collections, like fruit trees, kryo preservation techniques has been developed for plants like black currants, SESTO documentation system has been improved. Calls have been made and collections has been improved by the missing genotypes.

During recent years, national strategies have been prepared aiming at improving PGR conservation, like:

- The national strategy for conserving the crop wild relatives was published in 2013 (Heli Fitzgerald, MTT Report 121; link <http://jukuri.mtt.fi/bitstream/handle/10024/481549/mttraportti121.pdf>)
- Preliminary strategy for preserving perennial ornamental plants was also done (Juhanoja et al. 2013; <http://jukuri.mtt.fi/bitstream/handle/10024/481713/mttraportti123.pdf>)

Lot of impact has been given also in the European level, in the working groups of the ECPGR cooperation (European Cooperation programme for PGR). This includes tasks as participation to the international strategy work, f. ex. by defining descriptors and selecting genotypes for the virtual genebank AEGIS (A Report of the ECPGR/Aegis workshop: Establishment of the European forage collection, compiled by Merja Veteläinen).

National PGR programme has been actively increased knowledge and awareness of plant genetic resources on different levels, like teaching, presentations, public happenings, reports, publications, which has gain lot of visibility.

Research projects related to the genetic resources has been carried out f. ex. in social values, cultural heritage, evaluation and sustainable use, diversity analyses, cryopreservation and on farm conservation.

National legislation related into the access and benefit sharing of the PGR is also under development.

Finland has a relatively long history to maintain national AnGR's. The first national Action Plan was published in 1983 and it was updated in 2004. MTT Agrifood Research Finland is coordinating the National Action Plan. The National Action Plan promotes both *in situ* and *ex situ* conservation of genetic resources of cattle, dog, goat, horse, pig, poultry, reindeer and sheep genetic resources. The breeds within each species that are considered in the National Action Plan are native breeds and imported breeds with a long breeding history in Finland. There is Council of Genetic Resources in Finland nominated by the Ministry of Agriculture and Forestry. The mandate of the Council covers animal, fish, plant and forest tree genetic resources.

National funding for ***in situ* and *ex situ* conservation** activities has been available. In addition, farmers keeping old native breeds get special subsidy for their *in situ* conservation work. In Finland, there are three gene bank herds for native cattle and sheep breeds: on Pelso Prison farm and in the Ahlman Vocational College in Tampere and Kainuu Vocational College in Kajaani. These herds form the core of conservation work.

The strength in the Finnish Action Plan is the close connection with the research work. Molecular and phenotypic characterization of native breeds has been conducted and the Finnish breeds have been examined in the global context to evaluate their genetic value for the global domestic animal diversity. Various multidisciplinary studies have been done including processing properties of milk of native cattle breeds, branding, marketing, socio-cultural and socio-economic valuation. Finland has been active in international collaboration in research and conservation. For example, Russian, Polish, Kazakh, Ukrainian and Chinese farm animal breeds have been characterized in the molecular genetic studies coordinated by MTT. NordGen – Nordic Genetic Resource Center has promoted the Finnish national activities by providing tools for management of populations (to control inbreeding and kinships within the conserved breeds) and projects that have been also nationally important. The networking among the Nordic coordinators has been useful to develop the national activities. Once a year Genetic Resources –Newsletter is published. Education on AnGr-issues is given in vocational colleagues and few universities. The conservation of rare breeds has obtained publicity in Finland.

In Finland, there are no artificial insemination (AI) stations for sheep and goat breeding and the collections of semen and freezing must be done on farms. This is less effective compared to the situation where permanent AI stations would exist. In addition, there are no experts on poultry semen freezing. The national funding is not enough to have an effective and outstanding national program for the *in situ* and *ex situ* conservation of AnGR. Particularly, there should be more 'hands' available to do all the work listed in the National Action Plan.

A special challenge for the future conservation work is the decreasing trend of active farms in Finland. On the other hand, the Finnish farms will become bigger and there will be less livestock farms, but there the remaining livestock farms will have more animals. This trend will lead to situations where there are fewer opportunities to keep old native breeds. The bigger livestock farms will obviously favor few international commercial breeds in production. The current trend indicates that the Finnish Ayrshire breed, which has been for 50 years the most popular dairy breed in Finland, will be replaced by commercial Holstein cattle. On the other hand, there can be risks that breeding work also in cattle and pigs will be fully done by international companies and not nationally. The subsidy for keeping the old native breeds will be important also in the future, but also the promoting branding and marketing of native breeds' products will be of great importance in the future in order to have living

populations of native breeds. New breeds will be imported in Finland threatening the census sizes of the native breeds. The landscape management of culturally and biologically important regions will offer new possibilities to promote the raising of old native breeds. However, this trend will mean particularly for the native cattle breeds that these breeds will not be anymore used in their traditional production system in dairy production and the conservation approach would be *in vivo ex situ*. The Finnish native cattle breeds have been dairy breeds and have several valuable characters in their milk.

Ex situ and *in situ* conservation has been the most active one for the native cattle breeds. However, particularly the *ex situ* conservation of other species and breeds will be enhanced. The management of cryobank material will be developed (the duplicate storage, the use of long term storage and the responsibilities of different stakeholders to contribute to the cryobanking). The *ex situ* conservation of imported breeds which have a long breeding history (e.g. Finnish Ayrshire, Texel sheep and Yorkshire pig) should be better considered in the actions.

The future of the three living gene bank herds must be secured (administrative action) and these farms should get a status as national centers for Finnish native genetic resources.

Active and internationally high level research work on characterization of AnGR is our goal. The new genomic tools and approaches will be applied, such as transcriptome profiling and epigenetic profiling of native, locally adapted farm animal breeds to examine their special characters. Finland will have an active research networking with several international research groups, particularly with Russian and Chinese research groups. Multidisciplinary studies on values of animal genetic resources will be done.

The networking among owners of native breeds will be strengthened. The model for the networking can be obtained from the current conservation network of Landrace chicken owners.

Aichi target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

National target 14: Ecosystems that provide essential services, including services related to water, health, livelihoods and well-being, are restored and safeguarded, taking into account socioeconomic and cultural considerations, notably the needs of the indigenous Saami community.



The Economics of Ecosystem Services and Biodiversity Finland (2013–2014) - project aims to systematically incorporate the value of ecosystem services into all levels of decision-making. The project's goal is to identify Finland's most important (key) ecosystem services and propose methods to assess their current status and future trends. It will also aim to provide some preliminary estimates on the economic importance of some key services, especially the ones that so far remain under-recognized. Consequently, the project pays special attention to the regulating and cultural services that thus far have received limited attention. Building on the insights above, TEEB Finland will also analyze the opportunities for improving the governance of ecosystem services, including exploring how ecosystem services can be linked to supporting the development of sustainable green economy in Finland. The project will produce recommendations for effective integration of ecosystem services into decision-making processes, and for governing natural capital and ecosystem services. The project will also identify major knowledge gaps. [http://www.syke.fi/en-US/Research_Development/Research_and_development_projects/Projects/National_Assessment_of_the_Economics_of_Ecosystem_Services_in_Finland_TEEB_Finland/National_Assessment_of_the_Economics_of_\(16944\)](http://www.syke.fi/en-US/Research_Development/Research_and_development_projects/Projects/National_Assessment_of_the_Economics_of_Ecosystem_Services_in_Finland_TEEB_Finland/National_Assessment_of_the_Economics_of_(16944))

National Assessment of the Economics of Ecosystem Services in Finland (TEEB Finland) – Synthesis and Roadmap

Background: Ecosystem services and their role in contributing to human well-being are becoming increasingly recognized. In practice, however, the socio-economic importance and value of these services often remains unfamiliar to decision-makers and is not integrated into the decision-making processes. Consequently, there is a need to improve the knowledge in and understanding of the concepts of ecosystem services, as well as the ways different benefits provided by ecosystems - including the functions underpinning these benefits - can be measured and valued. In particular, there is a need to expand our understanding to cover the full range of ecosystem services, going beyond provisioning services. Such information is not only needed to support decision-making at national level but it is also crucial at local level, to support sustainable land-use planning and natural resource management (e.g. farming, fishing and eco-tourism).

Objectives: TEEB Finland (2013–2014) is a pioneering project that aims to initiate a systematic national process to incorporate the value of ecosystem services into all levels of decision-making. Project's goal is to identify Finland's most important (key) ecosystem services and propose methods to assess their current status and future trends. It will also aim to provide some preliminary estimates on the economic importance of some key services, especially the ones that so far remain under-recognized. Consequently, the project pays special attention to the regulating and cultural services that thus far have received limited attention. Building on the insights above, TEEB Finland will also analyze the opportunities for improving the governance of ecosystem services, including exploring how ecosystem services can be linked to supporting the development of sustainable green economy in Finland. The project will produce recommendations for effective integration of ecosystem services into decision-making processes, and for governing natural capital and ecosystem services. The project will also identify major knowledge gaps.

In terms of policy concrete objectives, TEEB Finland aims to support a number of ongoing policy processes at both national and regional level including, in particular, 1) development of national framework for assessing and monitoring ecosystem services (e.g. identification and establishment of appropriate indicators), 2) development of national policies and policy instruments supporting truly 'green' green economy and 3) supporting the sustainable regional development through the implementation of green infrastructure. Building on the above, the project is foreseen to contribute to Finland's commitments in achieving the global and EU biodiversity goals by 2020.

Process: TEEB Finland is carried out jointly by the coordinator, Finnish Environment Institute (SYKE) and the partners, The Agrifood Research Finland (MTT) and The Institute for European Environmental Policy (IEEP). As part of the project economic research institute Pellervon taloustutkimus (PTT) is investigating the present state and possibilities to apply conservation banking as one mechanism for safeguarding biodiversity and ecosystem services.

TEEB Finland is primarily based on synthesizing and analyzing existing knowledge. Furthermore, thematic expert working groups, covering key Finnish ecosystems, have been established. The purpose is to develop syntheses of ecosystem services state-of-play (e.g. available indicators and existing evidence base) while also seeking to establish consensus on the next steps. Finally, the insights of expert working groups will be complemented by workshops carried out to engage broader range of stakeholders (e.g. representatives of sectoral, industry and NGOs) into the process.

TEEB Finland consists of five components:

- Identifying Finland's most important ecosystem services and their indicators,
- Assessing the current state and future trends of Finland's most important ecosystem services,
- Providing insights to the economic value of the most important ecosystem services,
- Providing insights on how to better integrate ecosystem services into decision-making,
- Identifying the importance of ecosystem services and their role in promoting green economy,
- Synthesis and recommendations.

TEEB Finland is building on the TEEB Nordic scoping assessment (<http://www.teebweb.org/nordic-countries/>) and it will be implemented in close co-operation with a number of on-going national projects, e.g. developing national ecosystem service indicators (FESSI) and Green Infrastructure projects (GreenFrame).

Financier: The main financier of TEEB Finland is the Finnish Ministry of the Environment.

Results: The final results of TEEB Finland are foreseen to be published at the end of 2014.

The Environment and Gender Index (EGI) brings together environment and gender variables in a composite index. The EGI scores and ranks 72 countries worldwide along 27 dimensions divided into six categories (see EGI Framework below). Data is primarily from 2010-2012 and sourced from existing internationally recognized datasets. Finland belongs to the strongest performers together with other Nordic countries. Former President Halonen: “gender equality is a smart investment, the returns is not only visible on a human rights level, but also in terms of GDP”. See more at: <http://climatechange-tv.rtcc.org/2013/11/21/cop19-tarja-halonen-ex-finnish-president-on-importance-of-gender-equality/#sthash.GByxEmti.dpuf>
The second phase of the EGI—available at: www.environmentgenderindex.org

Aichi target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

National target 15: Ecosystem resilience and the contribution of biodiversity to carbon stocks have been enhanced through conservation and restoration. Finland participates in global efforts to restore at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification. The impacts of the increased use of bioenergy on biodiversity and the nutrient and carbon cycles of forests have been assessed, and guidelines have been set to safeguard biodiversity. Urban biodiversity is enhanced through conservation measures, management measures and the provision of structures that promote biodiversity.



Ministry of the Environment has set up a working group which will by the end of 2014 develop national priorities and suggestions for achieving the Aichi target 15 of restoration of degraded ecosystems at the global level. The group has nominated three expert subgroups for each main ecosystem: forests, mires, and culture-related habitats. The national work was started in a workshop on 11.–12.2.2014 with national key experts, authorities and NGOs. Restoration is seen in a wide perspective, including also nature management and passive restoration, for example (see 2.3 Recent actions).

In addition, Finland together with the other Nordic countries have committed to the CBD-target (Aichi-target) 15 on restoration of 15% of degraded land within 2020. The Nordic Council of Ministers supported this project to produce specific inputs on how the countries can formulate strategies for management and political authorities to approach this target. A project working group was established in June 2013 with representatives from governmental organizations in all Nordic Countries and Estonia, and the project will be reported during summer 2014. The on-going ‘EU strategic framework for setting priorities for ecosystem restoration’ and recent assessments of Nordic Restoration are important pillars in the project. This Nordic project gives the opportunity to explore how the EU framework can apply in Nordic ecosystems and what are the challenges. The project has put attention to the concept of degraded land, the quality and types of restoration, and priority setting and the

limiting factors to success. Case studies from different countries and habitats are used to elaborate these topics and also to discuss the question of scale, monitoring and evaluation. We aim at formulating statements about the need for restoration in different habitats, inputs on priorities, and to present ideas on how to overcome obstacles to restoration in the Nordic countries and Estonia.

Metsähallitus has under the METSO programme restored forests and mires in protected areas nearly 16 000 hectares between 2008 and 2013 and more than 26 000 hectares before 2008. The restored area covers approximately 0.1% of Finland's surface area.

The development of **national urban parks** (NUP) network is a part of Finnish biodiversity strategy and Action Plan (Action 81). The NUP network completes both national park and Natura 2000 network in Finland. Today there are altogether six NUP sites in Finland situating in Southern part of the country. All of them consist of diverse nature for example European Union Natura-2000 sites, national level protected sites and areas belonging to different national protection programs. For example the NUP of Hanko/Hangö consists of ca 6 000 ha marine environment in the southernmost part of Finland. It combines together several minor protected areas/areas important for preservation of endangered species and forms an "ecological marine bridge" between Saaristomeri Biosphere Reserve and Tammisaari/Ekenäs National Park. Turku, which includes the northernmost oak forests in the world, was appointed as a NUP in 2013.

The Ministry of the Environment is cooperating with cities in Finland to create a network of national urban parks. National urban parks provide an opportunity to experience nature in the middle of the city and they also provide other critical ecosystem services, for instance reduction of noise and better air-quality. What is notable is, that NUP decision is always dependent on the initiative of the local authorities and that the NUP area is formed by the plans made by a municipality. The decision to establish a national urban park is however made by the Ministry of the Environment. What is important is that the decision will be followed by a management plan drawn up by the local authority in close interaction with inhabitants and other relevant partners. Also the management plan is proved by the Ministry of the Environment.

For the identification of potential NUP areas, there has been used the following criteria: 1. Breath and content, 2. Extent and contiguousness, 3. Ecology and continuity, and 4. Urban centrality. A NUP area must fulfill all four criteria. The decision about the establishment of a NUP site is preceded by a consultative co-operation between a municipality and the Ministry, and a field evaluation.

With continuing urbanization, it is important to protect both biodiversity and cultural heritage as well as to ensure blue and green spaces for city dwellers. Green urban areas provide many benefits including outdoor activities and spending time in nature. In addition green areas provide many beneficial ecosystem services. The Finnish national urban park concept is part of the Land Use and Building Act. See more: http://www.ym.fi/fi-FI/Luonto/Luonnon_monimuotoisuus/Luonnonsuojelunluo/Kansalliset_kaupunkipuistot (in Finnish)

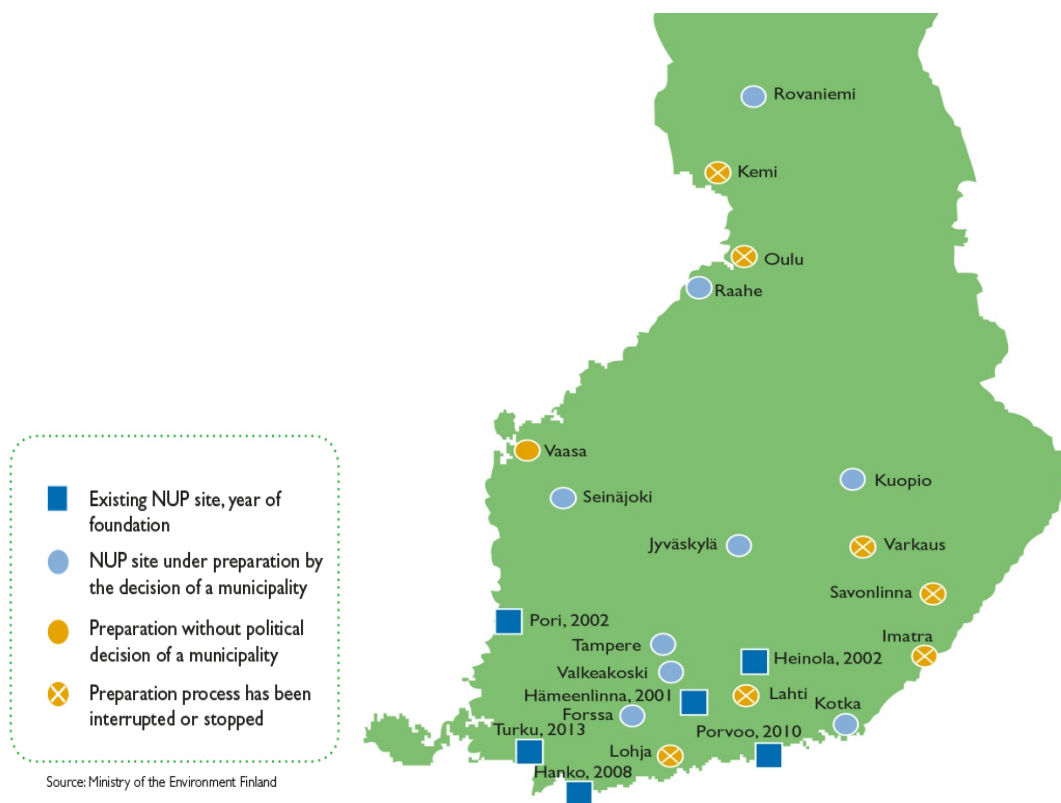


Figure 30. Location of National Urban Parks 2013. Source: Ministry of the Environment.

Aichi target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

National target 16: Practically identical.



Finland signed the **Nagoya Protocol** in June 2011 and has concluded and published a national study on the implications of the Nagoya Protocol on access and utilization of genetic resources in June 2012. The study contains administrative and legislative proposals for the implementation and ratification of the Nagoya Protocol including proposals for amendments to existing legal acts as well as a proposal for a new ABS Act. The legislation and administrative measures needed for ratifying the ABS protocol is prepared by a national ABS working group which started its work in 2013. Finland has designated a National ABS Focal Point and has an existing authority in relation to patent applications. Finland still needs to establish a National ABS Clearing House mechanism and checkpoints in line with the Protocol (e.g. research funding agencies). Finland is aiming to ratify the ABS protocol as soon as possible.

Aichi target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

National target 17: The implementation and impacts of the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Finland have been monitored for the purposes of an assessment report in 2015. The strategy will be implemented and evaluated cost-effectively in collaboration with various businesses and other stakeholders.



The Government of Finland made the 20th of December 2012 a **resolution on the Strategy for the Conservation and Sustainable use of Biodiversity in Finland 2012–2020**. Entitled **“Saving Nature for People”**, the strategy’s main goal is halting biodiversity loss in Finland by 2020. The new strategy replaces the 2006–2016 national strategy. The decision to update the previous strategy formed part of the Government Programme of Prime Minister Jyrki Katainen 2012–2015.

The new national biodiversity strategy rests on a solid basis in terms of international agreements. It will implement the decisions made in 2010 at the meeting of the Conference of the Parties to the Convention on Biological Diversity (COP-10), intended to improve the global implementation of the Convention. The strategy also takes account of the objectives of the European Union Biodiversity Strategy, and is based on a number of comprehensive national studies on the state of biodiversity in Finland and the factors influencing it. The assessment on the implementation of the NBSAP will be made in 2015 and the results reported to the Government.

Aichi target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

National target 18. The traditional knowledge, innovations and practices of the indigenous Saami community relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, restored and conserved, subject to national legislation and relevant international obligations, by developing legislation and administrative procedures related to the protection of this traditional knowledge. Finland’s implementation of the CBD allows for the full and effective participation of the Saami community at all relevant levels in line with decisions set out in the CBD and by COPs.



The Finnish Constitution guarantees the rights of Saami as an indigenous people to their own language and culture, and to autonomy in this respect in the Saami homeland. The Saami Parliament has been represented in the National Biodiversity working and follow group since 1996.

Metsähallitus and the Finnish Saami Parliament have drafted an operating model on the application of the Akwé:Kon guidelines concerning the implementation of the Biodiversity Convention. Akwé:Kon is a set of voluntary guidelines for assessing the impacts of projects and plans on land inhabited by indigenous people. <http://www.cbd.int/doc/world/fi/fi-nr-oth-en.pdf>

In 2013, the **Akwé:Kon** guidelines were used in the management and land use plans of Kevo Strict Nature Reserve and Urho Kekkonen Natural Park. The guidelines were introduced in the CBD 8j meeting in Montreal in October 2013. Metsähallitus and the Association of Reindeer Herding Cooperatives have signed an agreement on the reindeer herding area, containing provisions on e.g. negotiation procedures, the reconciliation of reindeer husbandry and the operations of Metsähallitus, carcasses, the land use system, reindeer feeding and reindeer fence agreements.

The Metsähallitus Natural Heritage Services is conducting an inventory of cultural heritage sites in Lemmenjoki and Urho Kekkonen national parks, which are located in the Sámi homeland. The forestry department inventories around 15,000 hectares of land west and north of the Hammastunturi wilderness area in Inari.

The preparation of the Nordic Saami Convention is steered by the Ministry of Justice. There are also representatives of the Ministry of Agriculture and Forestry, the Ministry of Education and Culture and the Ministry of the Environment in the working group. The aim is to complete the of the convention by 2016.

Aichi target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

National target 19: Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends have been improved, and are widely utilised, applied and transferred to those needing such knowledge and technology. The impact assessment processes for plans and projects are open, participatory, and based on professionally conducted inventories whose quality is assured.



The **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystems Services (IPBES)** was established in spring 2012. Finland became an IPBES member in 2012. The IPBES has 118 member organisations. The platform's work programme for 2014–2018 was approved in December 2013. Finland has worked consistently to strengthen the cooperation between science and politics, and to make the work related to international environment conventions more efficient. The Finnish science community's active participation in the platform is a prerequisite for Finland's strong status within the platform. Networking, both on a national and international scale, will give Finnish research the visibility it deserves.

The government made a resolution on 5 September 2013 to reform the structure and funding of state-owned research institutions. The main aim of the resolution is to strengthen multi-disciplinary and high-level research that is relevant for the society. The resolutions includes actions to improve and deepen the cooperation between research institutions and higher education institutions and to establish a financing instrument for strategic research. In addition, the responsibilities related to renewable resource statistics were centralised under the Natural Resources Institute Finland. The LYNET research consortium operations continued, in the form of collaborative research programmes, laboratory work, shared use of materials and the development of monitoring practices and know-how.

Recent policy decisions require free access to information generated using public funds. Finland is a member of the Global Biodiversity Information Facility (GBIF) established in 2001. The aim is that all Finnish museums of natural history and the actors conducting nature observations would join GBIF and that all 30 million specimen (natural history collections and observation data of research institutions, authorities and amateur naturalists' organisations) already in digital format would be shared through GBIF. So far 14.6 million specimen of national biodiversity-related data is shared through GBIF and there is 10 national information sources for GBIF in Finland.

In order to achieve goals for enhancing the national protection of species and cooperation between administrative sectors, it has been decided to establish a virtual Finnish Biodiversity Information Centre. The Finnish Biodiversity Information Centre will enable integration of the species observation systems of expert amateur naturalist communities into professional systems and facilitates wider use of existing data. This in turn enables the use of species location data collected by amateur naturalists, for example, for purposes of planning the protection of threatened species. Alongside the launch of the Finnish Biodiversity Information Centre, the development of other existing data systems, such as the environmental administration's TAXON database for red-listed species, is important as they will be data sources of the Finnish Biodiversity Information Centre.

The Academy of Finland is the key financier of scientific research in Finland. The Academy of Finland has a wide variety of funding opportunities and most of the funding is granted for investigator-driven, bottom-up research. The Academy's multidisciplinary research programmes address issues related to the grand challenges faced by society. Their share of Academy's funding is over 10%. Ongoing research programmes that address environmental spheres such as biodiversity are Climate Change (FICCA, 2011–2014), Sustainable Governance of Aquatic Resources (AKVA, 2012–2016), and Arctic (2014–2018). The Academy is also cooperating with key funding agencies in Europe and worldwide. It is participating in the joint European Baltic Sea Research Programme (BONUS) as well as the Joint Programming initiative "Water challenges for a changing world" (Water JPI). The Academy of Finland and the State of São Paulo Research Foundation (FAPESP, Brazil) have also joint research projects in the field of biodiversity and sustainable use of natural resources. According to the evaluations conducted by the Academy of Finland (Ecology and Evolutionary Biology in Finland 2006–2010, Evaluation Report 2012) the quality of research in Finland in the areas of ecology and evolution is high.

Based on the evaluations conducted by the Academy of Finland (the State of Scientific Research in Finland 2012 and discipline evaluations of evaluation of plant science in Finland 2011 and evaluation of ecology and evolutionary biology on 2013) the biodiversity related research is in general of high-quality in Finland.

Aichi target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

National target 20: Finland assesses opportunities to increase the availability of financial, human and technical resources to facilitate the effective implementation of the Strategic Plan for Biodiversity 2011-2020 as drawn up at CBD COP 10 and in line with decisions made at COP 11. Finland strives to obtain resources from all appropriate sources in accordance with the consolidated and agreed process defined in the Strategy for Resource Mobilization. National implementation depends on the availability of resources within spending limits set out in central government budget frameworks. This work will be steered in line with the needs assessments that are developed and reported by all Parties to the CBD.



Finland submitted its **Resource mobilisation strategy** to the Secretariat in March 2014 (CBD notification 2013-50). This submission builds upon the initial report in 2012 and the submission in response to notification 2012-023. The report for Finland differs from the previous because of increased reliance on Official Statistics. For the private sector only statistics on environmental expenditure in industry are reported. For the public sector the environmental protection statistics expenditure is allocated to environmental domains according to CEPA 2000 classification (Classification of Environmental Protection Activities and Expenditure),

Environmental protection expenditure allocated to biodiversity and landscape protection in the statistics is reported in the category *'Directly related to biodiversity'*. Expenditure allocated to waste management, waste water management and water protection or other environmental protection is reported in the category *'Indirectly related to biodiversity'*. Additionally, statistical data are specified in accordance with reporting requirements. Statistical data on public sector environmental protection expenditure are consolidated. That is, money transfers between the government and municipalities have been taken into account in calculations to avoid double counting. Additional information on statistics of year 2012 will be sent to the CBD Secretariat in April.

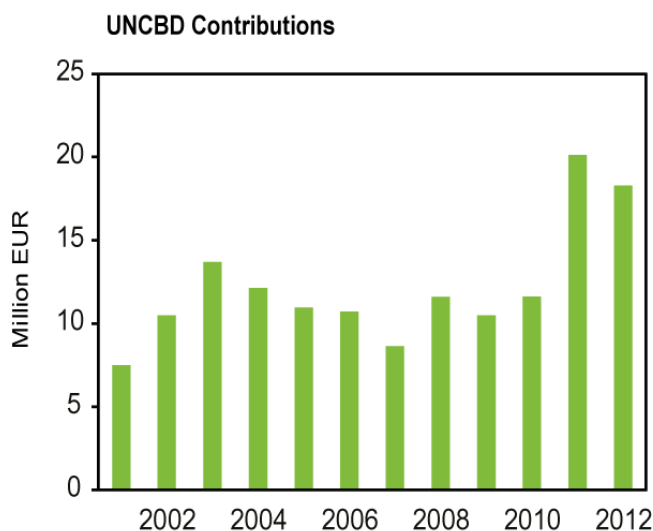


Figure 31. UNCBD contributions 2001–2012. Source: Ministry for Foreign Affairs of Finland.

3.1.2. Progress towards Millennium Development Goals

While the **Millennium Development Goals (MDGs)** are to be achieved by 2015 most of the Aichi Targets are to be achieved by 2020. In Finland a systematic and thorough assessment of the progress towards achievement of the Aichi targets will take place in 2015. Thus, this chapter only presents a preliminary and indicative assessment of the Millennium Development Goals and the Aichi targets. In the contributions towards achievements of the Millennium Development Goals and Targets 2015 the most biodiversity-oriented goal is MDG goal 7 (Ensuring Environmental Sustainability) and the most relevant targets under this goal are:

- Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources


Its biodiversity related indicators are:

- Proportion of land area covered by forest
- Ratio of area protected to maintain biological diversity to surface area

- Target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss (pls. note that this originates from 2005 UNGA decision and CBD COP-XI 2012 extended its overarching goal of halting the decline in biodiversity from 2010 to 2020)

Since the NBSAP was adopted in 2006 and revised in 2012 Finland has worked towards their fulfilment (see parts II and III for an overview of policies and strategies). Finland is also supporting developing countries to reach targets.

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Date of submission	28.04.2014

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