

Thematic Report on Forest Ecosystems Finland

1. What is the relative priority afforded to implementation of this decision by your country: **High.**

Private citizens own most of Finland's forests. Private forest owners number more than 630 000. Finnish forestry is commonly termed family forestry: small-scale forestry run by ordinary families. Private persons, whose role is important, own about 60 per cent of all Finnish forests as they supply more than 80 per cent of the industry's raw material in Finland. Private forest holdings are usually quite small, on average 35 hectares. Finnish forest owners have easy access to expert advice relating to the management of their forests. There are 206 Forest Management Associations, which provide forest owners with advice for example on forest management, forest taxation and biodiversity conservation. The Association's task, stipulated by law, is to promote private forestry by securing economic, ecological and social sustainability of forests. The expertise, including forest biodiversity aspects, of the Forest Management Associations is guaranteed by their trained personnel.

The planning of forestry operations has always played an important part in steering the sustainable forest management of both in private and state forests. A forest management plan is a ten-year programme drawn up by forestry professionals for the management of a forest holding. It contains information for example on the tree species, volumes, ages and biodiversity of the forest including ecosystem approach with valuable ecological sites and species. The regional Forestry Centres and Forest Management Associations draw up the forest management plans in private forests in cooperation with the forest owners. The Forestry Centres and Forest Management Associations provide forest owners with training and other advisory services for the implementation of their forest management plans.

According to the forest act the regional Forestry Centres are also responsible for drawing up and implementing a forestry target programme for its region. The forest act also states that the Forestry Centre, in drawing up the programme, co-operates with all parties representing forestry in the region and with other relevant parties. The regional target programme includes the general targets set for promoting the sustainable forest management, the targets set for the measures and their financing and the overall targets set for the development of sustainable forestry including biological diversity in the region. An assessment of the economic, ecological and social impacts of the implementation of the Regional Forest Programme is also included in every programme.

About one quarter of the land area in Finland is owned by the State, mostly in the northern and eastern parts of the country. Due to their geographical location and poorer soils, the State forests grow less on average than private forests. State-owned forests are managed by Metsähallitus, which in 1994 was reformed into a state enterprise. Metsähallitus utilises, manages and protects state-owned land and water areas.

In the state forests the development of Landscape Ecological Planning (LSEP) in Finland started as a cooperative project between Metsähallitus and the Finnish Environment Institute (FEI) in 1994. FEI is the national research and development centre of the environmental administration. The biodiversity assessment part of the planning method has been developed in a separate research project. The practical planning method has taken shape in the course of pilot projects, which were started, in areas administered by Metsähallitus in 1996. The principles of participatory planning have also been applied from the start. In this way local residents, nature lovers and other interested parties have been able to give direct feedback to the compilers of the individual plans.

A specialist-working group convened by Metsähallitus and compiled of researchers and representatives of the various interest groups has supported the planning development work

Landscape Ecological Planning is integrated forest management planning, in which ecological goals are aligned with different forms of forest use, while bearing in mind the objectives of forestry in the area. Landscape Ecological Planning views an extensive forest area as a whole including managed forests, nature conservation areas, game areas and special areas for recreational use.

The long-term objective of Landscape Ecological Planning is to assure the survival of the area's native species as viable populations. Among other things, this requires the conservation of existing valuable habitats and ensuring that new ones can evolve. In this way the planning contributes to the continued existence of valuable habitats as defined in the Forest Act and Nature Conservation Act. Planning can also be used to focus nature management activities including restorational operations on the sites that are the most crucial in ecological terms. The planning also involves the effort to assure the conditions for the spread of various species. In this effort, the valuable habitats and ecological links in managed forests complement and enhance already existing nature conservation areas. Together these form an ecological network, which intends to preserve biodiversity.

Another central goal of planning is to ensure that the conditions exist for multiple forest uses and for nature-based sources of livelihood. The procedure thus involves inventories of game habitats, scenic values and cultural, educational and research sites. In Northern Finland, the demands of reindeer husbandry play an important role. The weight given in planning to recreational use depends on the characteristic features of the area and on the recreational needs of the region.

Landscape Ecological Plans (LEP's) are drawn in open, interactive and people oriented way. The participatory management as applied in the Landscape Ecological Planning includes informing, gathering value based and geographic input, negotiating with the stakeholders and the public and giving them feedback. The aim is to improve the working relationship with all those stakeholder groups and citizens interested in the use of state lands and in the Landscape Ecological Planning of Metsähallitus. For this purpose open houses and working groups of stakeholders are arranged during the planning process. All public input is documented, analysed and, if feasible, taken into account. It is envisaged that through participatory management Metsähallitus will take care of the common property in a broadly acceptable way.

The final aim is to include 6.4 mill. ha of land in Landscape Ecological Planning. All areas administered by Metsähallitus are covered by LEP, except the northernmost lands beyond the tree growth limit in Lapland. Altogether more than 100 individual plans have been drawn up.

LEP's are implemented by the forestry operations of Metsähallitus. It is essential how areas surrounding key biotopes and other important habitats for biodiversity are managed in space and time. Typical production forest can provide a lot of support to special areas especially if well managed. Training of the staff of Metsähallitus has already been started. Training has been concentrated on the treatment of special areas and on the operation on adjacent forest stands. The management design of LEP is strongly supported by the Environmental guidelines to Practical Forest Management of Metsähallitus. These guidelines determine e.g. small-scale key biotopes, which are to be preserved in the forestry operations. They include also instructions for prescribed burning, retention trees, protection of water bodies, etc.

The plan will be reviewed after five years at the latest. The review will be arranged in line with the principles of participatory planning. The follow-up review will chart the present status of implementation and the action necessary to update the plan and to achieve the goals set. If necessary, additional inventories will be arranged to chart the implementation status. The objectives of Landscape Ecological Planning will also be reviewed in the context of new research. The review should state any new land use decisions, new research results and the feedback received on operations, which are then used as a basis for evaluating whether the plan is up to date and for making any necessary changes to the plan. Any changes to the threatened species classification should also be allowed for in the evaluation of the plans. The plans will be modified based on the review. New inventories and other research will be done if necessary. Review is followed by the next period of implementation.

LEP's have also been used and applied in forestry development projects for example in Russia and in developing countries (e.g. Laos, Nepal, Tanzania, Zambia and Namibia) receiving development aid from the Government of Finland.

The Regional Forest Programmes, which were revised and updated last year, are planning instruments for enhancing sustainable forest management in the 13 forest regions. According to the new Forest Act the Forestry Centres (13) are responsible for drawing up these programmes in cooperation with environmental authorities, forestry organisations and other relevant parties including NGO's. The programmes contain an overall description of forests and forestry and of the needs and objectives for development. In addition they contain a description of biological diversity of forests, needs for wood production, description of forestry enterprises and recommendations for promoting employment opportunities created by forestry. An assessment of the economic, ecological and social impacts of the implementation of the Regional Forest Programme is also included in every programme. The Regional Forest Programmes will be continuously revised also in the future.

During the present decade, one of the major starting points for the new objectives in Finland's forest policy has been international agreements and political commitments. Particularly important are those agreed upon in the UNCED conference in Rio de Janeiro, in the subsequent follow process (IPF, IFF and UNFF) and in the Ministerial Conferences for the Protection of Forests in Europe, including the follow-up of these conferences, too.

Finland actively followed the work of the Intergovernmental Panel on Forests (IPF). In Finland the Ministry Agriculture and Forestry carried out the responsibility of the work. To facilitate the work, the Ministry of Agriculture and Forestry established a working group with representatives from other ministries (e.g. Ministry of the Environment), institutions and NGO's such as Finnish Environment Institute, the Finnish Association for Nature Conservation and WWF Finland. The intention was to bring together different expertise from different organisations. In addition there were two forest biodiversity experts in the delegation of Finland.

In the 1990's the outcome of the international co-operation within the global forestry processes has been adapted to Finland's circumstances in the new forest policy, legislation and management guidelines. The implementation of the new forest policy has required a lot of information, education and extension services to the forest professionals, forest owners and the public. However, putting new acts and decrees into practice has been a rather smooth process. Finland will take an active part in the international fora on forest policy including environmental dimensions also in the future.

The forest and nature conservation laws were revised in 1997 to be complementary to each other. Forestry and environmental authorities as well as social and economic interest groups and other NGOs participated widely in the preparatory work. The laws implement international agreements on sustainable development and biodiversity. Forest legislation now focuses on promoting sustainable forestry, including the economic, social and ecological aspects. The Forest Act applies to all forest owners. Its purpose is to guarantee economically, ecologically, socially and culturally sustainable management of forests. The key element of the Forest Act, with regard to safeguarding biodiversity, is defining certain habitats of special importance and giving guidelines as to how these habitats may be managed.

Wood production and maintenance of biodiversity have equal importance in the Forest Act.

The purpose of the new Forest Act is to secure the production of timber, maintain the biological diversity of the forest nature and to take into account the multiple use of forests. Regeneration of forests after cutting has been described by law for more than a hundred years, and maladjusted felling must not be carried out in a growing forest.

The forest owner has to make an official declaration of intent to the Regional Forest Centre prior to all cuttings. This declaration is a tool for supervision, also with regard to securing biodiversity. A key element of the Forest Act with regard to safeguarding biodiversity, are its definition of certain habitats of special importance and its presentation of giving guidelines as to how these habitats may be managed.

As it is difficult for the landowners themselves to identify habitats that might be covered by the Forest Act, the Forestry Centres have been carrying out a survey on potential important habitats. The Act lists seven habitat groups where rare and endangered species may occur. Sites covered by the Act include, for example, small water bodies and the forest stands adjacent to them, small swamps, patches of herb-rich forest, small mineral land islets surrounded by mires in a natural state and is clearly distinguishable from their surroundings, the management and utilisation measures applied shall be carried out in a manner that preserves the valuable habitats. If the maintenance of forest biodiversity results in financial losses, the private forest owner can receive partial or total

compensation from the State funds (environmental aid). As a whole the implementation of the new acts is going on rather smoothly.

In addition to the new obligation to safeguard biodiversity, the new Forest Act also introduces a new instrument for enhancing sustainable forest management, the Regional Forest Programmes. The Forestry Centres (13) are responsible for drawing up these programmes in co-operation with environmental authorities, forestry organisations and other relevant parties.

Regional programmes, which were compiled in 1998, cover the whole country. They contain overall description of forests and forestry and of the needs and objectives for development. In addition they must contain a description and objectives of biological diversity of forests, needs for wood production, description of forestry enterprises and recommendations for promoting employment opportunities created by forestry.

An assessment of the economic, ecological and social impacts of the implementation of the proposals is also included in every programme. All the 13 regional forestry programmes were the bases during the formulation of the National Forest Programme. The regional forestry programmes will be revised at regular intervals. The first revision of the programmes started this year and it was finished by the end of February 2001. The above mentioned revision will include the development of the national criteria and indicators for the monitoring methods at regional level.

**2. To what extent are the resources available adequate for meeting the obligations and recommendations made:
Adequate.**

The Act on the Financing of Sustainable forest management guarantees state subsidies for such management activities in private forests, which in them would not be profitable for the landowner (e.g. biodiversity management). The absolute priority is on tending of young stands, that means stands which not yet has reached the age of a first thinning but where cleaning is needed. State financing is also available for forest regeneration in specific cases, afforestation of agricultural land, prescribed burning, harvesting of energy wood, forest fertilisation in some specific cases, improvement ditching and forest road construction. The State financing is some EUR 55 million per annum.

Forest owners can be provided with financial support for the maintenance of biological diversity in their forests. The state can give environmental aid, a total of about four million Euro per year. The forest owner can be provided with partial or total financial support for the economical losses caused by maintaining of biological diversity especially in the habitats of special importance. However, the forest owner must bear financial losses classified as insignificant. The level of insignificant losses has been defined as 4 % of the wood production.

As mentioned above, the management of especially valuable habitats may receive governmental funding, if the forest operation is more expensive than normally. The state can finance planning and implementation of forest ecosystem management projects on privately owned land:

- * restoration of important habitats which extend over more than one forest holding
- * surveying of important habitats
- * remedial forest works in context with the landscape management
- * restoration of a forest ditching area in a habitat of important natural value
- * other significant projects of regional importance (multiple forest use, cultural value, recreational value etc.)

Acts and decrees set the minimum quality requirements for silviculture. For private forests, there are forest management recommendations, which help the forest owner in the management and utilisation of his forest. The forest owners also usually have forest management plans (roughly 70 % of the private forest area) and they get extension services through Forest Management Associations and regional Forest Centres.

The silvicultural recommendations describe, for instance, which tree species ought to be grown on a specific site, the appropriate time for thinning a tree stand and how much timber can be removed. Forest and environment authorities and various organisations in co-operation create the environmental recommendations for forestry. The goal of these recommendations is a silvicultural practice which optimises the living conditions for organisms in managed forests and minimises the negative environmental impacts caused by forestry.

A key element of the Forest Act, with regard to safeguarding biodiversity, is defining certain habitats of special importance. The Act lists in all seven habitat groups where demanding and endangered species may occur. The Act on the Financing of Sustainable Forestry guarantees State subsidies for silvicultural activities in private forests.

The aspects and dimensions of the Environmental Programme for Forestry (1994) and the National Forest Programme 2010 are part of the National Action Plan for Biodiversity in Finland. The implementation of these forest programmes from the biodiversity point of view are being monitored by the Finnish National Biodiversity Committee. This involves all the relevant sectors of society under the process of monitoring the implementation of CBD in Finland. The Committee includes: all Finnish ministries, the Association of Finnish Local and Regional Authorities, the Confederation of Finnish Industry and Employers, the Central Union of Agricultural Producers and Forest Owners, the Sami Parliament and the Finnish Association for Nature Conservation. This Committee published its First Progress Report in May 2000. This report was distributed to all Contracting Parties of the Convention in COP 5 in Nairobi last year.

A sustainable ecosystem will be secured by a further studies of the ecological need for further nature conservation areas in southern Finland and further discussions on the environmental conservation of commercial forests based on the stipulations of the environmental programme of 1994 and the feedback it has generated. The Government resolution regarding water protection will reduce the environmental load caused by commercial forestry in accordance with a resolution in principle. Ratified protection programmes concerning privately owned land would be carried out during the period of 1996 - 2007 at a cost of EUR 600 million of budget money reserved for this purpose. In addition, a working committee (METSO) representing a wide range of expertise and interests will estimate the need for forest protection. A further task of the METSO committee will be to produce a forest protection programme based on financial and social aspects covering the southern part of Finland, the western parts of the province of Oulu and the southwestern region of Lapland.

3. Has your country assessed the status and trends of its forest biological diversity and identified options for its conservation and sustainable use: **Assessment underway.**

Finland has completed its biodiversity country study Biological Diversity of Finland (1998), which e.g. includes a description of nations forest biodiversity and its conservation. The report describes also the trends in the history, present state and the future of Finland's forest biodiversity. The state of forest biodiversity and its protection was also assessed while Finland recently compiled country's proposal for the European Union's Natura 2000 -network of conservation areas. Several forestry and environmental organisations collaborated in a working group (1999) with principal aims to clarify the definitions of forest protection, and to reach an agreement on the areas and percentages of protected areas in Finland. This working group classified the forests according to their level of protection. The options for the conservation of Finland's forest biodiversity have been assessed also in several other occasions. The Finnish Biodiversity Research Programme FIBRE (1997-2002) produces information for the assessment of biodiversity and selection of political tools.

The Finnish Environment Institute (FEI) has been assessing the state of the whole network of nature conservation areas and its ability to guarantee the preservation of various habitat types (e.g. forests) and threatened and seriously declining species (e.g. forest species). The results relevant to the development of forest protection will be transferred to a separate working group, which is discussing about the improvement of the status of forest protection in Southern Finland. The Nordic Council of Ministers has compiled a report Natural Woodlands in the Nordic Countries (1998), which e.g. summarises the history of forest use and conservation efforts of natural forests in the Nordic region.

The Ministry of the Environment's the Second working group monitoring Finland's threatened species compiled recently a third list of threatened species. This work involved following trends of populations, and applied the categories of the IUCN classification of threatened species in Finland. Finland was one of the first countries to adopt it widely by applying both the old and new IUCN categories for threatened species. The working group has made several suggestions and options to improve the conservation of threatened species in Finland.

The Working group on the need for protection of forests in Southern Finland has examined the conservation status of forests in Southern Finland during 1999-2000 and made proposals regarding the need to develop the

protection of the region's forests. Based on this report, the National Forest Programme for 2010 and the work of another broad-based interest group nominated recently, a programme of action, funding and aims will be prepared for forests in Southern Finland, and implemented on its completion. Economic and social factors concerning the use of forests will be considered along with ecological factors when the need of protection is defined.

5. Has your country identified methodologies for enhancing the integration of forest biological diversity conservation and sustainable use into an holistic approach to sustainable forest management at the national level: Yes, significant extent.

Finland has recently renewed its legislation to promote the conservation and sustainable use of biodiversity. On the forestry side, the Forest Act and the Act on the Financing of Sustainable Forestry have been renewed e.g. to meet the principles of the CBD. Also the acts of forestry organisations have been renewed. The new Forest Act e.g. defines habitats of special importance to be preserved and the Act on the Financing of Sustainable Forestry sets out the ways that the nature management of commercial forest ecosystems will be funded.

The need to maintain biodiversity in the development of sustainable forestry has been stressed in all levels of this trade. The importance of the conservation and sustainable use of biodiversity is clearly evident in the National Forest Programme for 2010 approved by the Government in 1999. The programme balances ecological, economic and social aims with the intent to achieve and maintain favourable conservation status for species and habitats through a suitable combination of protected areas and the application of varied management methods in commercial forests. Steps will be taken to reduce the ecological risk factors, which became apparent during the environmental impact assessment (EIA) for the programme. The New Environmental Programme for Forestry in Finland (1994-2005) is being implemented as an integral part of the forest programme. The recent concrete environmental renewals of Finnish forestry practices are based on this environmental programme. These renewals are being described in detail in the environmental programme and its follow-up reports (1995-1997).

The valuable forest habitats of commercial forests have been described in several publications and educational materials directed to the forestry professionals in every level, researchers and general public. These valuable forest habitats are being surveyed in a separate inventory programme, which has been carried out by the regional forestry centres (see Tenhola & Yrjönen 2000). Studies suggest that these valuable sites will mainly, in forestry practises, also be correctly preserved. The important habitats of Forest Act, the habitats types covered by the Nature Conservation Act and other key biotopes are taken into consideration in the regional forest planning with multiple aims, natural management of commercial forests and forest certification. Regional natural resource plans (Regional Natural Resources Planning, RNRP) and regional ecological plans (Landscape Ecological Planning, LSEP) will soon cover all state-owned lands.

The large forest industry companies, Metsähallitus (Forests and Parks Service), the Forest Development Centre Tapio, regional forestry centres and over a hundred forestry associations have their own environmental management systems. The recently developed forest certification standards (Finnish Forest Certification System, FFCS) are being implemented by the forest owners and other involved forestry professionals throughout the country. The ecological management of commercial forests is done according the silvicultural recommendations, which have been just recently updated. The principles of nature management in commercial forests are included in these recommendations.

The results of managing forests ecosystems are monitored nationally on privately owned land, on land owned by the large forest companies and in state-owned forests. This monitoring work is also applied in the Finnish Forest Certification System (FFCS). This monitoring is being developed in cooperation with environmental and forests experts. The national forest biodiversity monitoring system will be developed on the basis of national forest inventory, monitoring of threatened animals and plants, survey of nature management in commercial forests and some forest species inventories.

In 2000 the Central Union of Agricultural Producers and Forest Owners published its revised Forest Biodiversity Action Plan and Recommendations for private forests. This plan is based on e.g. the latest inventories on threatened species in Finland and studies on forest ecosystems and biodiversity. The strategy encourages forest owners to pursue diversified forest management.

High professional competence of foresters and the awareness of forest owners are an essential factor on the conservation and sustainable use of forest biodiversity. Forest organisations, e.g. Metsähallitus, the organisation responsible for the administration and management of state-owned forests, has developed their activities and planning and trained their personnel with regard to the management of biodiversity. The training and guidance of forestry workers and officials, forest owners, forest machinery operators and foresters have been central to the practical application of the environmental principles for forestry.

A Diploma in Natural Forest Management has been developed for forestry workers, officials and forest owners. In connection with this course a wide range of education materials has been produced. Forest Development Centre Tapio distributed hundreds of thousands of copies of their information on nature management methods (publications and leaflets) between 1997 and 1998. With the increasing importance of forest certification his training and the production of education materials will continue to be extensively carried out over the next years. For example the Ministries of Education, Environment, Agriculture and Forestry with their regional authorities have a significant scientific and educational responsibility for promoting the conservation and sustainable use of biological diversity. According to the implementation reports of the state plans, the principles of biodiversity and sustainable use of natural resources are observed in the syllabi and curricula at all levels of the education system. Environmental studies and research on biological resources are more and more identifying the needs for the sustainable development at all levels. In addition, the Ministry of Education has asked all universities and polytechnics to take the principles of biodiversity and sustainable development into their research programmes. Also the new national core syllabus and curriculum includes the principles of biological diversity at both vocational and general education.

During the 1990's the research funding has steadily risen to a level of 3 per cent of the gross national product in 1999 and the level of education funding is about 5 per cent of the gross national product. The figures are above the average of the OECD countries.

The education authorities within the existing state budget frame have actively advanced the conservation and promotion of biological diversity. Its main channels of influence include the Finnish Biodiversity Research Programme (FIBRE) coordinated by the Academy of Finland (1997-2002). The goal of the FIBRE Programme is to produce state-of-the-art research results on biological diversity, with the applicability of the results as a central goal. Applicability refers to all those activities aiming at the conservation of biological diversity as well as the compatibility between the conservation and sustainable use. The funding for the first three years was EUR 12 million, and the estimated total funding for the six years will be more than EUR 20 million. Approximately one third of the programme is focusing on forestry issues.

Finland has participated actively in building up a mutual understanding on forest biodiversity related matters. At the moment the coordination of sustainable forest management with the Convention on Biological Diversity and with the Framework Convention on Climate Change and the Kyoto protocol and in the definition of forests' role as carbon sinks and reservoirs. Finland is assessing carbon sink and reservoir capacity of the forests through research and forest inventories. Approximately EUR 15 million per year has been used in the development aid projects in the environmental sector including biological diversity research. This sector is one of the focal points of the Finnish aid also in the future.

For example the Department of Biodiversity at the University of Turku has the Amazon research team, which carries out interdisciplinary research with activities especially in the Western Amazon region. The team has researchers in the departments of Biology, Geology and Geography and it includes senior scientists, PhD students and undergraduate students. The team is acting as a forum for interdisciplinary interaction among scientists with different backgrounds in Amazonian research. This goal is met through cross-disciplinary teamwork in many different combinations of researchers, and by sharing common research facilities such as literature and map collections, field data and computerized databases.

In addition the team aims at analytically approaching the question of how variable the Amazonian tropical forests are regionally. The evolutionary, ecological and practical consequences of this variability are addressed from many different points of view, and remote-sensing imagery often plays an important role in the research

University of Helsinki is also carrying out following projects related to biological diversity research funded by the Finnish development aid: Nicaragua-Finland Environment Programme, Biodiversity Support and Protected Areas; the Botany, Mycology and Multiple Use in the Natural Forests of Usambara, Tanzania; Tanzanian Myxomycetes; Wood-rotting Fungi in North-eastern China; Historical Biogeography of the Pacific Fauna and Biodiversity of Tropical Southeast Asiatic Bryoflora and Hepatics.

6. Has your country developed methodologies to advance the integration of traditional forest-related knowledge into sustainable forest management, in accordance with article 8(j): **Yes, limited extent.**

7. Has your country promoted cooperation on the conservation and sustainable use of forest biological resources at all levels in accordance with articles 5 and 16 of the convention: **Yes, significant extent.**

8. Has your country promoted the sharing of relevant technical and scientific information on networks at all levels of protected forest areas and networking modalities in all types of forest ecosystems: **Yes, significant extent.**

Finland is supporting through its development aid the implementation of capacity building measures for the conservation and sustainable use of forest ecosystems for example in Amazon region and in Usambara, Tanzania. Most of the government-funded forestry and other environmental projects include biodiversity components.

The first phase of the Global Environment Facility (GEF) ran from 1991 to 1994 and the Finnish funding volume for the first period was about one billion EURO. Later the funding volume has increased being some 5 billion EURO in 2001. About 40 % of the funds from Finland are allocated to the biological diversity sector. The principal beneficiaries of GEF are the developing countries. Finland has also been actively participating and contributing to the IPF and IFF processes leading to the establishment of the United Nations Forum on Forests (UNFF) in October 2001. Many of the IPF/IFF proposals for action, which are related to forest biodiversity, will be implemented through CBD process. UNFF will strengthen political commitment to the management, conservation and sustainable development of all types in the world.

Having considered the interests of government ministries, economic sectors, research and environmental organisations and of the relevant groups, in 1996-1997 the National Commission for Biological Diversity drafted the National Action Plan for Biodiversity in Finland (1997-2005), in accordance with a decision-in-principle made by the Finnish Government in 1995. The Action Plan sets out 124 specific measures to be taken by 2005 to ensure the conservation and sustainable use of biodiversity, and also allocates responsibility to various sectors and defines the costs and resources required.

In 1998 the Ministry of Environment set up a working group to monitor the implementation of the National Action Plan. The group's tasks are to liaise and promote cooperation between the various sectors involved, to coordinate and assess the implementation of the Plan and the monitoring of the state of biodiversity in Finland, and to supervise the preparation of summary reports. The group will also propose revisions and alterations to the plan as required.

The Finnish Clearing-House Mechanism of the CBD was established in 1998. It is available in Finnish (<http://www.vyh.fi/luosu/lumo/lumonet/kansi.htm>) and in English ([http://www.vyh.fi/eng/enron/\(cdlearh/kansi.htm](http://www.vyh.fi/eng/enron/(cdlearh/kansi.htm)). Finnish CHM is based on the articles of CBD and on the National Action Plan for Biodiversity. Finnish CHM is designed for researchers, decision-makers, civil servants, teachers, journalists and other specialists, but also for general public. Finnish biodiversity researchers are supporting the development of biodiversity information systems in some developing countries (e.g. Peru, Nicaragua and Guatemala). Finnish CHM has tried to establish a CHM-partnership project with Ecuador.

9. Has your country promoted activities for an enhanced understanding of positive and negative human influences on forest ecosystems by land-use managers, policy makers, scientists and other relevant stakeholders: **Yes, significant extent.**

10. Has your country promoted activities to assemble management experiences and scientific, indigenous and local information at the national and local levels to provide for the sharing of approaches and tools that lead to improved forest practises with regard to forest biological diversity: **Yes, significant extent.**

11. Has your country promoted activities with the aim of providing options to minimise or mitigate negative and to promote positive human influences on forest biological diversity: **Yes, significant extent.**

The National Forest Programme 2010 continues the tradition of Finland's previous forest programmes. Its contents stretch over a larger range of topics than before and cover issues, such as forest utilisation as seen from an economic, ecological, social and cultural perspective. In addition to domestic demands, the programme is designed to meet the new international forest policy norms. Strong recommendations for introducing national forest programmes are to be found in several international forestry resolutions and declarations from the 1990's.

The forest programme has been compiled through widespread participation in the work process and is designed to serve both the interest groups involved and the average citizen. The programme is a process: its development will be upgraded and checked in accordance with changing demands and incoming feedback information. The drafting process of the programme has been carried out through teamwork in an open and public-spirited atmosphere, which allowed everybody with an interest in forests to participate.

The fundamental idea behind the programme is that a competitive forestry cluster combined with the fact that forests are a renewable resource, make an excellent foundation for sustainable development.

A sustainable ecosystem will be secured by a further studies of the ecological need for further nature conservation areas in southern Finland and further discussions on the environmental conservation of commercial forests based on the stipulations of the environmental programme of 1994 and the feedback it has generated. The Government resolution regarding water protection will reduce the environmental load caused by commercial forestry in accordance with a resolution in principle. Ratified protection programmes concerning privately owned land would be carried out during the period of 1996 - 2007 at a cost of EUR 600 million of budget money reserved for this purpose. In addition, a working committee (METSO) representing a wide range of expertise and interests will estimate the need for forest protection. A further task of the METSO committee will be to produce a forest protection programme based on financial and social aspects covering the southern part of Finland, the western parts of the province of Oulu and the southwestern region of Lapland.

Hunting, reindeer husbandry, various forms of wild berry and mushroom picking, landscape and cultural values, outdoor recreation and trekking, all of which represent the many forms of usage the forests can offer, will be taken into account and advanced within forest management and protection.

Forestry know-how and innovative activities within the forest sector will advance by means of developing research, implementation of results and training. A forum for innovation will be formed in order to increase the interaction between the parties representing theory and practice. Finland will take an active part in the international forum on forest policy, forest research, training co-operation and media exposure about forests and the environment also in the future.

Prior to the implementation of the National Forest Programme 2010 a detailed estimation of its environmental impact was made. Apart from governmental actions, the programme is dependent on decisions and actions taken by the forest industry and the forest owners. If any part of the programme cannot be realised along the lines that have been planned, then the whole programme would be checked and adjusted accordingly. For the implementation and follow-up of the National Forest Programme a Forest Council elected on a broad base has been formed with several subordinate-working committees.

The Forest Council led by the Minister of Agriculture and Forestry is implementing and following the National Forest Programme. The biggest and most important national environmental non-governmental organisations; the Finnish Association for Nature Conservation and WWF Finland, have their representatives working as full members of the Forest Council of Finland. Ministries of Environment, Finance, Commerce and Industry, Finnish Forest Industries Federation, Finnish Forest Owners Association, Finnish Saw-Millers Association, Finnish Forest Research Institute, Scouts of Finland, Forest Contractors Union, Union of Professional Foresters, Union

of Technical Foresters, Association of Hostesses of Farming Families and Union of Forest Workers have also members in the Forest Council.

12. Has your country promoted activities to minimize the impact of harmful alien species on forest biological diversity: Yes, significant extent.

The impact of alien species on the boreal forest ecosystems of Finland has been minor so far. The Nordic Council of Ministers has recently published a report "Introduced species in the Nordic Countries" to clarify the situation concerning introduced species. An Internet based "Nordic Network on Introduced Species" (NNIS 2000) has also been established. The website (<http://www.sns.dk/natur/nnis/>) contains a list of administrators and scientists working within the field of introduced species. In addition, the network includes databases on marine, freshwater and terrestrial biomes. Detailed information on the introduced species in Finland was recently compiled by the Ministry of Environment, and published as a printed report "Alien species in Finland" in 2000 and also through Finnish CHM (<http://www.vyh.fi/luosuo/lumo/lumonet/aliens.htm>). The Nordic "Introduced species" report identifies over 1350 species that have been introduced either intentionally or unintentionally to the Nordic countries. The total number of alien species that are known to become established in the terrestrial ecosystems of Finland is ca. 600. Most (ca. 500) of these are plant species associated with old agriculture or ruderal areas. None of the alien species has become a significant forest pest in Finland, nor is known to be displacing native forest-dwelling species up to the present.

The small number of native tree species and the harsh climate are the principle ecological factors reducing the probability of potential invaders to become established. The use of exotic tree species has been very limited in Finnish forestry, accounting for less than 0.1 % of the total forest area. Larch species (mostly Siberian larch (*Larix sibirica*)) have been cultivated on a total area of ca. 20,000 ha. Following the introduction, at least 21 insect species monophagous on larch have become established in Finland.

Section 43 of the Finnish Nature Conservation Act (1096/1996) restricts the introduction of non-native species into Finland. Non-native plant species are not to be planted or sown outside gardens, fields or other sites designated for special purposes. If a non-native plant or animal species is known to spread rapidly in the wild, and there is a reasonable cause to suspect that it might constitute a health hazard or have a detrimental effect on indigenous Finnish species, the Ministry of Environment may issue any regulations as prove necessary to prevent the spread of such species. In accordance with the Hunting Act (615/1993, 1268/1993), wild bird or mammal species of foreign origin can not be imported or released in the wild without a permission of the Ministry of Agriculture and Forestry.

The Plant Protection Law (1203/1994) lays down provisions to prevent the introduction of pests and diseases of plants into Finland. In addition, pests and pathogens which are present in Finland as native or introduced, but which are not widely distributed, can be controlled in order to prevent their further spread. Secondary legislation lays down detailed provisions for import, monitoring, eradication, control and containment, and is enforced by a central authority, the Plant Production Inspection Centre.

Among the most successful invaders of forest environments, four mammal species serve as examples. All these species were introduced as game or fur animals in the 1930s: mink (*Mustela vison*), racoon dog (*Nyctereutes procyonoides*), white-tailed deer (*Odoileus virginianus*) and Canadian beaver (*Castor canadensis*). The racoon dog has spread over most of southern and central Finland. It mainly eats small mammals, plants and carcasses and does not seem to affect native biota strongly. The mink has spread all over the country, and probably affects native species more, however, mainly in riverine ecosystems and the outer archipelagos of the Baltic Sea and not in forest environments.

There are at least two species pairs in which the introduced North American counterpart seems to outcompete the native Eurasian species: American and European mink (*Mustela lutreola*), and Canadian and European beaver (*Castor europaeus*). The European mink is now considered to be extinct in Finland. The species started to decline already before the 1940s, well before the American mink spread widely and became abundant in most parts of Finland. However, the present dense American mink population efficiently prevents the recovery of B or any attempts to reintroduce B the European mink in its original distribution area. The Canadian beaver is

presently spreading in Finland, and potentially threatens the populations of the native European beaver, which only occurs as reintroduced in the westernmost Finland; the distribution areas of the two species do not yet overlap. Active control campaigns have been used in the case of the raccoon dog and mink. The hunting of white-tailed deer and Canadian beaver also serves to reduce the economic and ecological damages caused by these species.

Of potential new forest pests, the pinewood nematode *Bursaphelenchus xylophilus* is considered a major threat in Finland. The species evidently originates from North America, and was introduced to Japan at the turn of the previous century. The nematode has become the most devastating forest pest in Japanese pine forests. Studies on the ecology of the species in Finland clearly indicated that Finnish pine forests would meet all the nematode's essential biological requirements (including host tree, potential vector insects, and summer temperature) for successful establishment. The pine wood nematode has been under particular surveillance by Finnish plant health officials already since 1984 when specimens were found in pine wood chips imported to Finland from North America.

Importation of conifer wood was rapidly banned from countries where the species was known to occur. Since December 1999, intensified inspection of coniferous packing case wood was started. Out of the 578 inspected lots of packing wood, 18 have contained living pine wood nematodes (Plant Production Inspection Centre, information available at: <http://www.vyh.fi/luosuo/lumo/lumonet/aliens.htm>). Finland is the only EU member country that has adopted, beginning from the 31st of May 2000, a requirement that an international phytosanitary certificate is attached to each shipment of commodities containing coniferous packing wood and originating from a country where the pine wood nematode is known to occur.

Although the EU plant health legislation has recognized the risks associated with coniferous wood used for packing, the recent finding of the pine wood nematode as established in Portugal has underscored the potential need to tighten the current EU plant health regulations with respect to such wood.

13. Has your country identified means and mechanisms to improve the identification and prioritisation of forest activities related to influences of human activities, in particular forest management practices, on forest biological diversity: **yes, limited extent.**

14. Does your country hold research results and syntheses of reports of relevant scientific and traditional knowledge on key forest biological diversity issues and, if so, have these been disseminated as widely as possible: **yes, already widely disseminated.**

15. Has your country prepared case-studies on assessing impacts of fires and alien species on forest biological diversity and their influence on the management of forest ecosystems and savannahs: **yes, in boreal forests.**

The Finnish Biodiversity Research Programme FIBRE (1997-2002), initiated by the Academy of Finland, aims at producing top scientific research with high applicability on the following themes: understanding the factors generating, maintaining, and threatening biodiversity at the genetic, species and ecosystem levels, understanding the functional relevance of biodiversity, including the role of ecosystem goods and services and social aspects, the utilisation of genetic resources, and the development of analytical tools. All these themes aim at supporting the sustainable use of biological resources and the conservation of biodiversity. Applicability of the research results for e.g. decision-making and environmental policy is a key priority for the programme. Furthermore, the training of experts for national and international tasks in the biodiversity field is a major concern.

The FIBRE programme represents a considerable national investment in research and development in the biodiversity field, both in terms of the interdisciplinary scope and the level funding involved (about 120 million FIM/ 20.2 million Euro). FIBRE is being financed by nine different agencies, including both government and private sector.

The funding for the first stage of FIBRE programme (1997-1999) was used to finance 59 research projects (about 62 million FIM/ appr.10.4 million Euro). These projects included research in the fields of biology (ecology, systematic, genetics, microbiology), forest research, biotechnology, economics, sociology, cultural research, philosophy and environmental law. FIBRE has also been very important in terms of the training and

experience the research has provided for specialists, which will be of benefit in this field and its applications for the years to come. During its first stage, FIBRE has funded the work of 85 doctoral students and 18 post-doctoral researchers. Including all part-time researchers involved, a total of 300 researchers are participating in the programme. During the second stage of FIBRE (2000-2002), the level of research funding and the number of students involved will remain at comparable levels with the first stage.

The Academy of Finland prepared an international mid-term progress evaluation of the FIBRE programme in 1999. The evaluation panel was chaired by Dr. Calestous Juma of Harvard University. The projects for the second stage of FIBRE (2000-2002) were selected in the autumn of 1999. The recommendations of the mid-term progress report were considered in the preparation of the second stage of the programme.

FIBRE has assisted in bringing together different scientific disciplines to carry out interdisciplinary research on biodiversity issues in Finland, and to increase the exchange of information. Co-operation between universities and research institutes progressed significantly during the first stage of the programme. Ecological research on the threats facing ecosystems, and the mechanisms of ecosystem resilience and recovery as well as research at species and genetic levels increased significantly, especially concerning the boreal forest ecosystems. Juridical and socio-economic research on biodiversity also progressed considerably. The connections FIBRE has set up between the researchers and end users of data are very valuable, but still need to be intensified. The active exchange of information also facilitates the application of new data, which is a key component towards the end of the programme.

16. Has your country assessed experiences gained in national and regional processes, identifying common elements and gaps in existing initiatives and improving indicators for forest biological diversity: Yes, significant assessment made.

The new alignments in the Finnish forest policy advance the principles accepted at the United Nations Conference on Environment and Sustainable Development in Rio de Janeiro in 1992 and at the Ministerial Conferences in Strasbourg, Helsinki and Lisbon. Important milestones have also been the development of the New Environmental Programme for Forestry in Finland adopted by the Ministry of Agriculture and Forestry and the Ministry of Environment in 1994 and its follow-up reports.

In 1995, a national process to define criteria and indicators developed within the follow-up of the Helsinki Ministerial Conference provided a framework for the Finnish national criteria and indicator project. The six Pan-European criteria were taken as terms for sustainable forest management of Finland's forests. In the process the set of Pan-European indicators was complemented with, in particular, indicators concerning biological diversity and socio-economic functions of forests.

Altogether, some 160 quantitative and descriptive indicators were chosen. The aim of the first set of national criteria and indicators was to provide a tool for the follow-up and the evaluation of the state of forests and forest management in Finland. The criteria and indicators were tested in Pirkanmaa region, covering closely one million hectares of forest land. The pilot project tested the applicability of national level criteria and indicators at sub-national and local levels and provided information on their usability in strategic planning of sustainable forestry.

Later in 1998 it was recognised that the national indicators need to be revised as new scientific information and practical experience of their applicability taking into account the recent development of international forestry processes (e.g. IPF/IFF proposals, the Lisbon Resolution L2).

A new working group was appointed in 1998 for the revision of the Finnish national set of criteria and indicators. Representatives from 13 different organisations such as ministries, research organisations, forest industries, forest owners, universities and non-governmental environmental organisations (the Finnish Association for Nature conservation and WWF of Finland) took part in the work of the open-ended working group. The new, revised set of national criteria and indicators were published in January 2001 and the new set of regional criteria and indicators was ready in February 2001.

The national criteria and indicators will be a tool used for following up the implementation of the resolutions passed at the ministerial conferences on the protection of European forests. Criteria and indicators will be also used in monitoring Finland's National Forest Programme 2010, which is implemented and reviewed in the same atmosphere of public involvement in which it was created.

17. Has your country carried out taxonomic studies and inventories at the national level, which provide for a basic assessment of forest biological diversity:

Yes, significant assessment made.

Finland has a long tradition of taxonomic, faunistic and floristic research dating back to the early 1800s. Strong participation and commitment of skilful amateurs (ornithologists, botanists, entomologists etc.) has always been a feature typical for this kind of research in Finland, and has helped to accomplish various large-scale inventories of fauna and flora.

The most comprehensive monitoring system for an assessment of the general state and changes of forest ecosystems in Finland is the National Forest Inventory carried out by the Finnish Forest Research Institute (<http://www.metla.fi/tutkimus/vmi/nfi.htm>). The inventory has been performed since the early 1920s, and the 9th inventory is in progress at present. A total of over 70,000 sample plots systematically covering the whole country are measured. Although the main purpose of the inventory is to provide information on the forest resources, i.e. the volume, growth and quality of timber in different parts of the country, considerable amounts of other ecological data have been gathered at the same time.

For instance, distribution and abundance maps of over 100 dominating forest and mire plant species were published in 1964 based on vegetation cover measurements on the sample plots of the 3rd inventory. Changes in the distribution and abundance of the same species from the 1950s to the 1990s were recently published based on the 3rd NFI and permanent plots established in the 8th NFI (measured in 1985 and 1995). Several measures indicating forest biological diversity were added to the 9th inventory that started in 1996, including the volume of dead wood, occurrence of key tree species, and the occurrence of so called especially important biotopes (key habitats) with an assessment of their state of naturalness. In addition since the 8th NFI in the 1980' s also the health of forests has been monitored via NFI.

The most important foundation of avifaunistic research was the about two hundred local studies conducted all over Finland since the mid-1800s. Finnish ornithologists paid special attention to distribution changes of bird species from the 1930s to 1960s. Since the 1970s, however, human-caused environmental changes have been recognized as the principal factor for most of the rapid expansions and, on the other hand, population contractions. Nation-wide quantitative censuses on the abundance of breeding birds were started in the 1940s and 1950s. These extensive lines transect censuses all over Finland have provided a unique source of data for long-term and large-scale monitoring of breeding bird numbers. The nation-wide line transect censuses were continued in the 1970s and 1980s.

Two atlas surveys of breeding birds have been accomplished in Finland, the first one in 1974B79, and the second one in 1986B89. Birds occurring in each of the 10 x 10 km atlas square in Finland (using a uniform grid; the total number of squares is 3,855) were surveyed with comparable methods as accurately as possible in both the atlas surveys with three degrees of breeding evidence: possible, probable and confirmed breeding. The combined data from both the atlases cover most of the country; only 42 squares lying along the borders remained totally unchecked. The fieldwork was mainly done by thousands of voluntary amateur ornithologists. The total number of observations was about 250,000 in both the surveys; these figures include every species once for each square where it was recorded. Distribution maps for each species, population sizes and trends etc. were presented in a report "Distribution, numbers and population changes of Finnish breeding birds" in 1998. The second Finnish atlas survey was part of the European-wide atlas project, which used 50 x 50-km UTM (Universal Transverse Mercator projection) squares as observation units.

The Finnish Game and Fisheries Research Institute (<http://www.rktl.fi/english/index.html>) is the organisation responsible for the monitoring of large mammal species and game birds. A comprehensive wildlife survey is implemented each year using so-called wildlife triangle scheme, which is a joint effort, by the institute and the

Finnish Hunters' Central Organisation. The wildlife triangle is a triangle-shaped census line with the length of each side 4-km, thus giving a total length of 12 km of the line. There is a network of over 1,600 permanent triangles covering the whole country, of which 400(1000 have been censused each year starting from 1988. Some 5,000 hunters participate to the censuses voluntarily each year.

Game birds are censused along the triangle in late summer, whereas mammals (including practically all medium-sized and large Finnish species) are censused during the winter based on their tracks on snow. The results are published yearly as reports. Comprehensive distribution and abundance maps of 27 game mammals (*sensu lato*), with data on population trends in Finland have been recently published. Inventories on small mammals, bats and the Russian flying squirrel have been carried out by special working groups and amateurs; unpublished atlas of small mammals in Finland based on 10 x 10 km grid squares is kept and under preparation at the Finnish Forest Research Institute. All available distribution data on mammals from Finland was used in "The Atlas of European Mammals", in which the European distribution of each species is presented in 50 x 50 km UTM squares.

The Finnish Museum of Natural History, under the administration of University of Helsinki, is responsible for the preservation and accumulation of the national zoological and botanical collections, as well as for basic taxonomic research on Finnish fauna and flora. The collections of the Zoological Museum comprise about 8 million items (including 7 million insect specimens B one of the most important insect collections in Europe), about, half of which originate from Finland. Every year the collections increase by some tens of thousands of specimens, mainly due to donations and expeditions. Besides the actual collection, the museum has an extensive database of zoological records and observations. The directing unit of Finland's bird banding research, Rengastustoimisto, also administratively belongs to the Zoological Museum. The Botanical Museum comprises about 3 million herbarium specimens of plants and fungi, and the annual increase is over 20,000 specimens.

The Botanical Museum has e.g. been responsible for editing digital distribution maps for the vascular plants of Europe (Atlas Florae Europaeae; see: <http://www.helsinki.fi/kmus/afe.html>). The maps contain symbols for the status (including native occurrence, established alien, extinct etc.) of each species in each grid cell. There are also other important national collections at different provincial universities. The second largest collections belong to the Zoological Museum and Herbarium at the University of Turku. The zoological collections contain about 3 million samples, mostly of terrestrial arthropods (see: <http://www.utu.fi/ml/elainmuseo>). The Herbarium contains over 0,5 million samples of vascular plants and fungi, and belongs to the 150 largest herbaria worldwide (see: <http://www.utu.fi/ml/kasvimuseo>). Other museums include Zoological and Botanical Museums at the University of Oulu, Jyväskylä University Museum and Kuopio Museum of Natural History.

The Finnish Environment Institute is responsible for coordinating the monitoring of threatened animals and plants in Finland. The Institute assists the Regional Environment Centres and Metsähallitus (former Finnish Forest and Park Service) in prioritizing regional tasks connected to protection, management and monitoring of species. In its own surveys and monitoring, the Finnish Environment Institute has concentrated on threatened plants, beetles, butterflies, moths and wood-decaying fungi. The methods and frequency of monitoring vary among species and species groups. The Institute also maintains the database on threatened animals and plants. At present, the database contains about 50,000 records of 1250 species, which are red-listed in Finland (see: <http://www.vyh.fi/luosuo/lumo/lasu/setuterh.html>).

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