

MetlaBulletin



Newsletter of the
Finnish Forest Research Institute
2/2007

Finland takes care of
forest biodiversity

*Metla on the
Lookout in Asia*



METLA

Newsletter of the Finnish Forest Research Institute (Metla) 2/2007
Published twice a year.

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The role of forest research in providing data for forest policy discussions

The forest research community is a key producer of forest-related data for national and international forest policy dialogue and decisions. A timely and concrete example of the importance of research to support decision-making was provided at the fifth Ministerial Conference on the Protection of Forest in Europe (MCPFE), held in Warsaw, Poland at the beginning of November this year. For the conference a comprehensive report, "State of Europe's Forest 2007" was prepared as a joint effort involving numerous scientists and organizations throughout Europe. The report is based on the Pan-European Criteria and Indicators for Sustainable Forest Management.

However, the data alone is not enough. To facilitate international use and informed decision-making, harmonized and agreed definitions and terms, and the content and scope of forest characteristics are also needed. The work that this represents naturally draws together scientists and foresters as well as other players involved in practical operations. Such cooperation and joint discussion also provides a learning process for the various countries, cultures and forestry conditions.

Finland has made an active contribution to the development of criteria and indicators since the second MCPFE in Helsinki in 1993. The third set of indicators for sustainable forest management based on Pan-European frame has been developed, and the third report on the "State of Finland's Forest" was compiled and published in 2007. The indicators have been used in Finland particularly in the presentation and reporting on forestry as well as in the monitoring and preparation of the National Forest Programme and the Regional Forest Programmes. The indicators have also been used to steer practical silviculture, forest management and forest certification as well as for new research initiatives.

As a sector research institute, Metla has played a key role in Finland by providing the data and compiling the reports on sustainable forest management as a whole. This Bulletin issue demonstrates some of the key ways in which the work of Metla contributes to the setting of national forest policy, while also taking international development into account.

Dr. Jari Parviainen

Director of Metla Joensuu Research Unit



Research News



Metla/Erkki Oksanen

Japan's superior market waiting for matsutake

Matsutake (*Tricholoma matsutake*) is a very highly regarded mushroom in Japan. Japan's annual imports of matsutake amount to more than three million kilogrammes. Finland has gained its first experiences of exporting 1000 kg of matsutake to Japan in 2007. In May 2006 a two-year EU-funded project was started at Metla to clarify the presence of matsutake in Finland. In addition a Matsutake seminar was arranged by Metla at Kihniö in September 2007. The seminar contained presentations on matsutake research in Japan and experiences in Finland and Sweden about exporting matsutake to Japan.

More information at:
www.metla.fi/hanke/7226/index-en.htm



Metla/Erkki Oksanen

Wood yield from peatland forests can be increased

Metla and the Forestry Development Centre Tapio have completed a joint study, in which the effects of thinnings and ditch maintenance on the growing stock increment and the economic result were determined for the first time. The project also produced a computation model that can be used to evaluate whether it is profitable to continue silvicultural procedures after the stand in question is felled. Based on these research results, Tapio and Metla have created silvicultural recommendations for peatland forests covering the whole of Finland.

More information at:
www.metla.fi/hanke/7187/index-en.htm

Punkaharju to represent the northern conifers' zone in the European ISS network

The Punkaharju research forest area of Metla has been chosen as one of the seven Intensive Study Sites (ISS) of the EVOLTREE Network of Excellence. Forest genetic research distributed over Europe will be concentrated in the Intensive Study Sites to clarify the climate change impacts on the adaptation of forests and trees. In the ISS network, Punkaharju represents the northern boreal ecosystems. The other sites are located in Poland, Germany, Switzerland and France. The Intensive Study Sites are part of the major EVOLTREE research network programme that aims to integrate European research infrastructures, expertise and information pools on forests. 44 research organizations from 15 European countries participate in EVOLTREE.

More information at: www.metla.fi/hanke/8514/index-en.htm

Nature has positive effects on human well-being

Nature and recreational tourism have become increasingly important for modern man. The well-being derived from nature used to be based on the economic utilization of nature, but today the effects are emphasized on mental and stress-relieving factors. Nature-based tourism has been studied in Finland since the 1990s, and Metla has a long tradition in this field of research. The starting point in the recently ended project has been research into the principles and requirements of sustainable tourism, which means that special consideration has been paid to local values in the cultural research approach. Another achievement of the project was a collaboration network created between the researchers studying recreational use and nature-based tourism from different perspectives. The results are presented in "Nature-based tourism, forests and well-being", a publication by Metla. The resources in the project comprised researchers of Metla, the Universities of Lapland, Joensuu and Tampere. The research was funded by the Academy of Finland.

More information at: www.metla.fi/hanke/3295/index-en.htm

Wood provides opportunities in the Barents region

As a renewable natural resource, wood offers plenty of opportunities for the future of the Barents region and northern Europe. Planned activities, product development and cooperation between different players are required. These matters were discussed in the Barents Forest Forum held in Joensuu, Finland, in November 2007 that brought together participants that represent companies, administration, and financing, training and research institutes. The seminar was organised by Metla and other research institutes. The Barents region covers thirteen areas in Northern Norway, Sweden, Finland and North-West Russia. The area is vast, corresponding to approximately 45 per cent of the area of the European Union, but the number of inhabitants is only about six million. Forests represent one of the major natural resources in the area, significant in being renewable, unlike the resources of ores, gas and oil.

More information at: www.metla.fi/tapahtumat/2007/barents/



Mesta - Solutions to multi-goaled decision-making problems

Metla has developed a interactive decision support application called "Mesta", intended for use in multi-goaled choice situations with varied parameters. Mesta gives a recommended decision, i.e. the one that best meets the goals set by the decision-maker. A good example of a decision-making problem in the field of forestry, would be selecting a forest plan from the various alternatives produced for the forest holding. Mesta Interactive Forest Planning software is a product of the "Methods and processes in decision-making in forestry" research group. The group provides methods for identifying, analyzing and solving problems in decision-making by applying and further developing general decision-making theories. The group is part of a larger research network.

More information at: www.metla.fi/org/dm

A record-old pine found in Lapland

Researchers of the Kolari Research Unit of Metla found what is believed to be the oldest Scots pine (*Pinus sylvestris*) in eastern Lapland. The tree's age is estimated to be 780 years. The record-breaking pine grows in the Urho Kekkonen National Park. The oldest living pine was found during the EU-funded project "Interreg-Tacis Northern Coniferous Forests - Tools through research for the sustainable use of forests in the Barents Region". The project is studying the dynamics, structure and biodiversity in Finnish Lapland, the Kola peninsula and Archangelsk. The results of the research can be utilized to develop forest management methods for simulating disturbance dynamics.

More information at: www.metla.fi/hanke/7224/index-en.htm

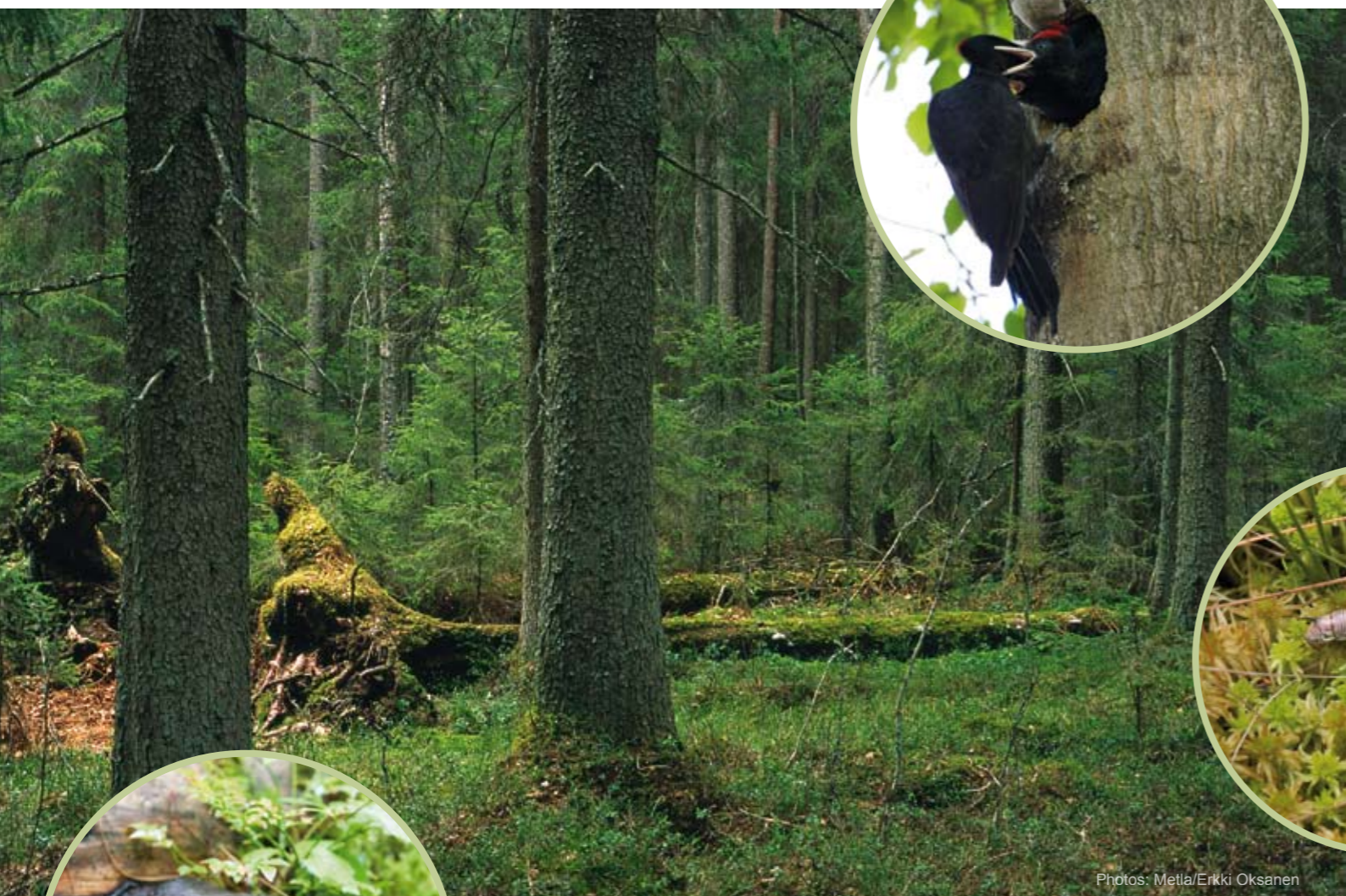
The most northern gene reserve forest in Finland

Metla has established the most northerly gene reserve forest in Finland in the research forest area of Laanila, Inari. Kuusipää is the most northerly spruce forest in Finland, and the area of the new gene reserve forest is 335 ha. The aim of gene reserve forests and storages is to protect the genetic diversity within species. The Kuusipää gene reserve forest serves as a focus for protection and research relating to the genetic material of spruce trees that have adapted to extreme conditions. Finland has 43 gene reserve forests and their total area is approximately 7 300 ha. The forests have been established at different climatic zones to ensure that a comprehensive number of different adaptive characteristics will be protected.

More information at: www.metla.fi/hanke/3347/index-en.htm



Metla/Sirpa Luukkonen



Photos: Metla/Erkki Oksanen

Finland takes care of forest biodiversity

Jari Parviainen

Biodiversity in Finnish forests has been looked after in various ways. Due to extensive nature conservation programmes and silvicultural management of commercial forests, the pace at which certain species in Finnish forests are being threatened has slowed down. The area of protected forests in Finland is amongst the largest and the level of protection is the strictest in Europe.

These results are included in the newest "State of Europe's Forests 2007" report, published at the beginning of November in Warsaw at the Ministerial Conference on the Protection of Forests in Europe (MCPFE). In parallel with the emphasis on biodiversity, the volume of the growing stock over the past 40 years has increased more than 40%, in spite of the high utilization rate. On average, annual fellings in Finland amount to 65–70 % of the annual increment of the growing stock.

The fifth Ministerial Conference on the Protection of Forests in Europe (MCPFE) was held in Warsaw at the beginning of November 2007. A 2007 report on the state of Europe's forests, based on the quantitative indicators common to all Europe, has been compiled for the conference. A parallel report on the forests in Finland was published during the summer 2007, and its forest data are included in the European report. Hence, we can now also make conclusions about the state of Finland's forests compared with other European countries.

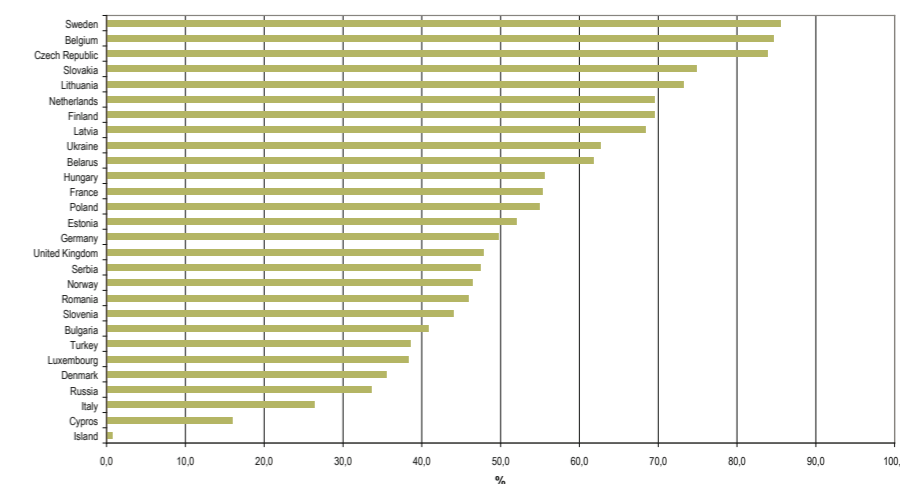
The state of Finland's forests has been evaluated three times already, in 1996, 2000 and 2007, using a set of national indicators based on the corresponding European MCPFE quantitative indicators on sustainable forest management. The long-term development series help to determine what kind of changes have occurred in the state of Finland's forests and how they meet the objectives of the forest and environmental policies.

A lot of forest land but an average amount of wood per hectare

Finland is the most forested country in Europe. As much as 75% or 23 million hectares of our land area is covered by forests. Additionally, land area for forestry purposes contains also more than three million hectares of the total forestry land or other land areas, such as open mires where no or only a few trees are growing. This means that 86% of all land area in Finland is classified as forestry land area. There are only three countries in Europe where forest cover comprises more than half of the land area: Finland, Sweden and Slovenia.

However, Finnish timber resources are not the greatest in Europe. Based on timber resources, also Sweden and France are ahead of Finland. Germany has the highest volume of trees in forests and produces twice as much timber per hectare as Finland. Naturally, the difference is due to differences in climate, sites and different tree species. If we look at managed spruce forests in Germany and Finland, in Germany they grow 10-15 metres higher with diameters 10-20 cm greater than in Finland.

Seventy per cent of forests in Europe are mixed forests. The proportion of mixed-species forests has increased over recent years. Due to more favourable growing conditions the number of species is the greatest in Central and Southern Europe. The forests in Finland are predominantly one-species forests, though the share of mixed forests is increasing. The pre-



▲ Annual fellings as percentage of the net annual increment for European countries in 2005, MCPFE 2007.

dominant species in Finland is Scots pine, with a share of 66%. Spruce forests account for 25% and broadleaves for 9%.

In Finland the economic value of forests to the national economy is the greatest in Europe. The value of forest industry products is approximately a fifth of the total value of exports. However, the percentage has gradually diminished, while especially the share of electrical and information technologies have grown.

Similarly, the importance of the forest sector for employment is still considerable in Finland, and statistically the highest in Europe. The proportion of the entire labour force working within the forest sector is roughly 4%, though there has been an annual decrease in the number of employed persons.

Utilization rate of forests and biodiversity are associated

Forest biodiversity, i.e. the structure of forests and conservation of species in the forests, is evaluated based on nine indicators. The most interesting indicators, from the point of view of Finland, are naturalness, regeneration, deadwood and the amount of protected forests.

The biodiversity of forests is often examined in association with their utilization rate. The utilization rate of the forests in Europe, i.e. annual fellings expressed as a percentage of annual increment is approximately 50%. Excluding the Russian Federation, the utilization rate is 58%. The utilization rate has clearly increased in

all European countries over the past ten years.

The utilization rate of the forests in Finland is relatively high. During recent years, it has been around 65-70%, but it is still not the highest in Europe. On the other hand, since the increment and timber resources have been continuously increasing, the volume of fellings can be increased without a risk to forest biodiversity, provided that close to nature forest management is used.

Sweden has the highest utilization rate, though their forests suffered severe storm damage in the early 2000s. Albania is missing from the picture; the utilization rate in Albania is exceptionally high, five times the increment.

The share of renewable, wood-based fuels of total energy consumption is as high as 20% in Finland. However, Latvia is the country where wood-based fuels have the greatest value, their share being as high as 35%. After Latvia and Finland, the next biggest users of wood-based fuels are Sweden (14%), Albania (10%) and Austria (9%).

Human intervention on forests in Europe

Long-term human intervention has changed the structures of European forests. The largest forests undisturbed by man are found in Russia and in East-European countries. It is estimated that the share of forests undisturbed by man in Finland is less than 5%. They are mainly located in nature conservation areas in Northern and Eastern Finland. ►►

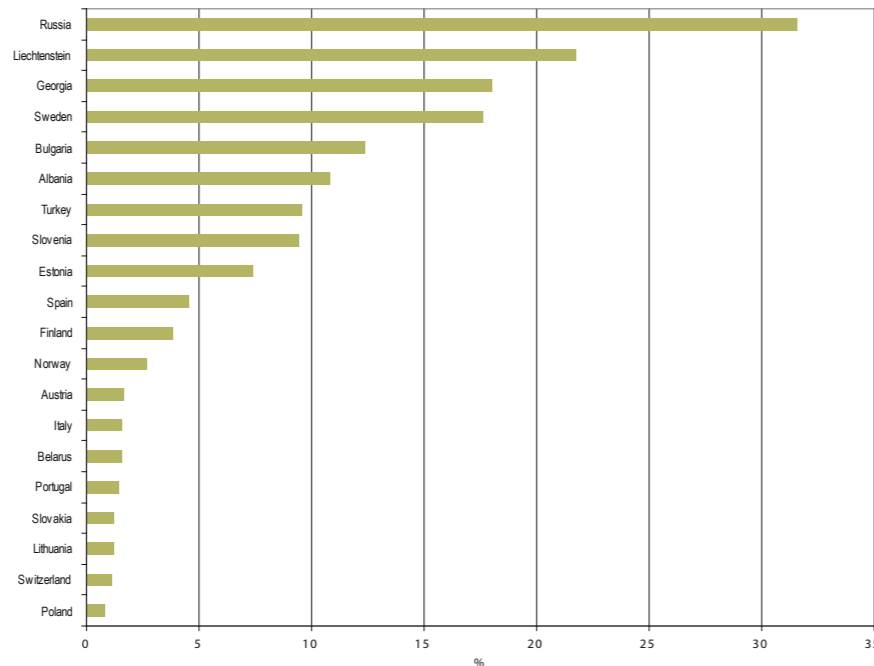
Finland also lacks tree plantations, i.e. cultivated forests based on introduced tree species. Finland's forests are managed, semi-natural forests; their regeneration is performed with domestic tree species and the majority of forests are naturally regenerated by local tree species. The largest number of tree plantations has been established in Western Europe. The profile of commercial forests in these countries is different from that in Finland.

Forest regeneration methods vary between the different countries in Europe. This is natural because there are differences in tree species and vegetation zones. The share of natural regeneration in Europe is roughly 40% and it is continuously increasing. Planting and seeding are commonly performed in Northern Europe, while natural regeneration is widely practiced in the beech forest areas in Central Europe due to the beech being shade-tolerant and soil being easily regenerated. Coppicing with suitable tree species is surprisingly common in Italy, Albania, Bulgaria and Hungary.

Deadwood volume as an indicator of biodiversity

Decaying wood is considered to be an essential factor that maintains forest biodiversity. Species that depend on deadwood are diverse; some need deadwood through their entire lives, some only at a certain phase of their life cycle. Examples of these species are hole-nesting birds like woodpeckers, several beetle species and polyporous fungi.

There is a lot of natural variation in the amount of deadwood between the different vegetation zones. Therefore, it is not reasonable to compare the amounts of different countries. However, reporting deadwood indicates clearly that maintenance of biodiversity has been taken into consideration in commercial forests everywhere in Europe. The development trends of deadwood are not completely known, since data compilation was started only a few years ago. The amount of deadwood in Russian forests is very high, but it is partly due to the large areas of forests undisturbed by man.



▲ European countries (20) with the highest share (%) of forest undisturbed by man of the total forest area, MCPFE 2007.

Finland has focused on protecting forests to maintain threatened species

Establishing protected areas is one of the oldest means for the conservation of natural resources. There is still a lot of variation between the different European countries as to the diversity of the different protected areas and the strictness of protection. There are 65 000 – 70 000 different protected areas in Europe, based on more than 800 different national protection classes.

Therefore, a special MCPFE classification for protected forest areas was created during 1999- 2006 to enhance comparable reporting on the protective measures applied in different European countries. As a result, new information on the protected forests in Europe could be presented in the Warsaw Ministerial Conference.

On average, 8% of European forests are protected to maintain biodiversity. However, the majority, 80% of the protected forests belong to the MCPFE classes in which certain silvicultural measures or active management are allowed, for the main goal of maintaining biodiversity. Only 15%, 2.4 million hectares, are classified as strictly protected forests where no human intervention in forest struc-

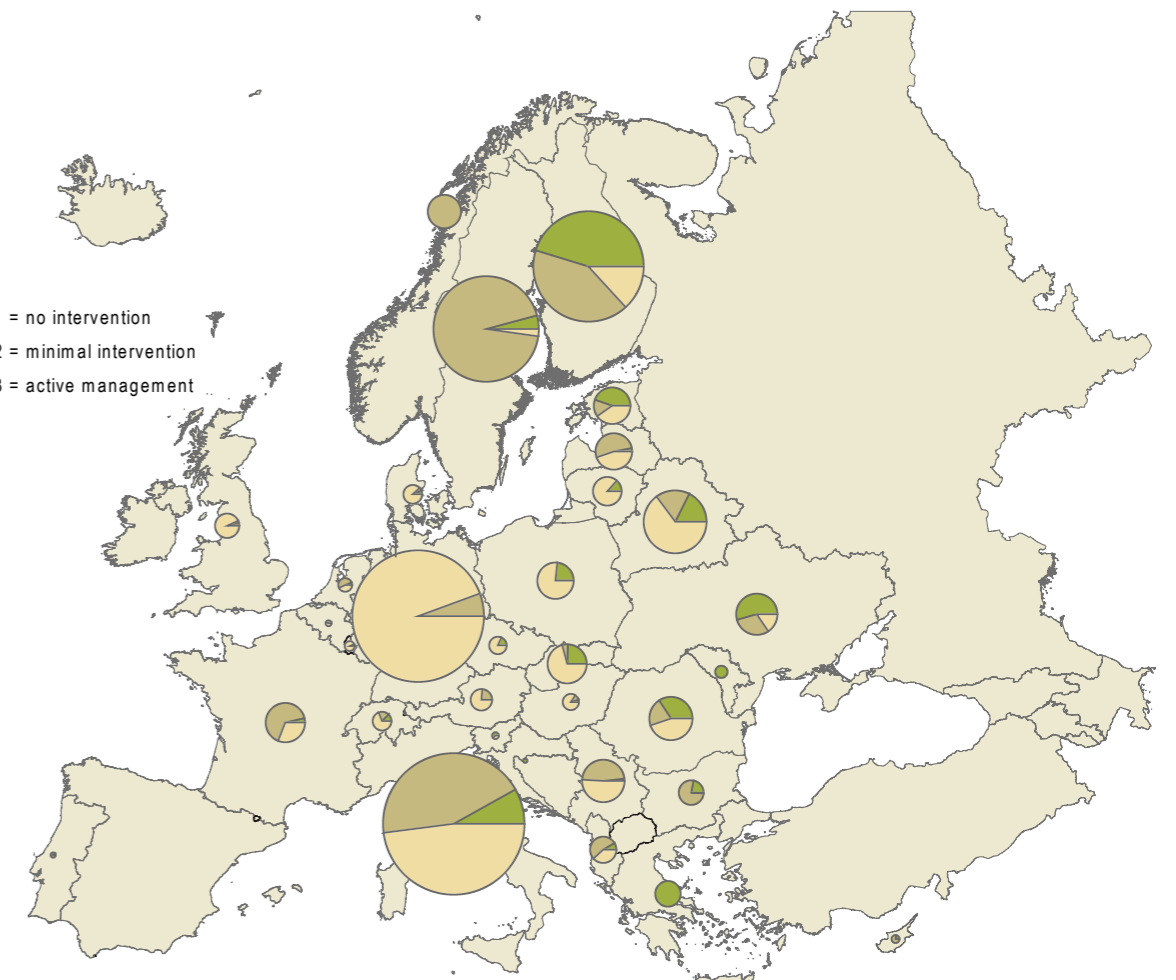
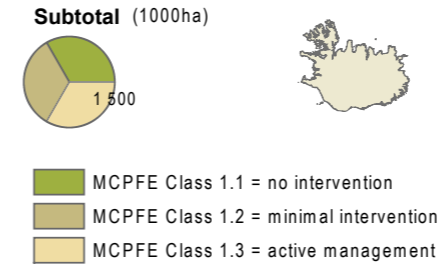
tures is allowed, and more than half of them are located in Finland. As a whole, the area of protected forests in Finland is among the largest and the level of protection is the strictest in Europe.

The majority of Finland's protected forests are located in Lapland. Similarly, protected areas in other European countries are also located far away from populated areas, on mountains or other areas where human intervention has been minimal.

Main attention on safeguarding forest biodiversity in commercial forests

Based on the amount of protected forest areas, Germany, Italy and Sweden have also protected substantial forest areas to maintain biodiversity. However, protected forests in Germany, Italy and Sweden are mostly ones where restricted fellings are allowed or where active forest management and fellings are performed for biodiversity purposes. Different from other countries, the protected forests in Germany include also commercial forests containing Natura 2000 sites.

Through several national protection programmes, the area of Finland's protected forests has tripled over the last 30 years. In the new forest law enforced in 1997 biodiversity was



adopted as a parallel objective with wood production in commercial forests. At the same time, silvicultural recommendations were revised to be more biodiversity-oriented.

The essential new elements in forest management were to leave old retention trees standing and increasing amounts of dead trees lying in regeneration areas, and to protect key biotopes and their threatened species as non-felling areas. The new silvicultural recommendations and simultaneous additional protection of forests have slowed down the reduction of certain threatened species.

In Southern Finland the status of forest biodiversity is improved not only through silvicultural development but also by private forest owners' voluntary participation in the protection measures. Additionally, the status of protection areas on state holdings is improved by restoration procedures. ■

More information:

State of Finland's Forests 2007 Based on the Criteria and Indicators of Sustainable Forest Management. Publications of the Ministry of Agriculture and Forestry 7/2007. 99 p. www.mmm.fi/attachments/SIPRusizK/5tIpZspXX/Files/CurrentFile/state_of_finlands_forests.pdf

State of Europe's Forests 2007. The MCPFE report on sustainable forest management in Europe. MCPFE Liaison unit, Warsaw and UNECE/FAO. 249 p. www.mcpfe.org/files/ul/publications/pdf/state_of_europes_forests_2007.pdf

▲ Share of MCPFE Classes 1.1–1.3 of the total forest and other wooded land area protected for biodiversity by countries in MCPFE regions. Data for Germany, Estonia and Luxembourg include the Natura 2000 areas, MCPFE 2007.

Author of the article:

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MCPFE Quantitative Criteria and Indicators for Sustainable Forest Management

as applied to Finnish forests

Criterion 1: Forest resources

Preservation and increase of forest land

- Forest area
- Growing stock
- Age structure of forests

Maintenance of carbon balance in forests

- Carbon stock
- Use of wood-based fuels

Criterion 2: Health and vitality

Maintenance of health and vitality of forests

- Deposition and air pollutants
- Chemical soil condition
- Defoliation
- Forest damage

Criterion 3: Maintenance and encouragement of productive functions of forests (wood and non-wood) (Productive functions)

Safeguarding wood production

- Increment and drain
- Quantity and value of annual fellings
- Coverage of forest planning

Maintenance and enhancement of services and non-wood good Safeguarding and increasing services and non-wood products

- Non-wood goods
- Services, particularly of recreation

Criterion 4: Maintenance, conservation and appropriate enhancement of biological diversity in forest ecosystems (Biological diversity)

- Tree species composition
- Forest regeneration
- Natural forests
- Introduced tree species
- Deadwood
- Genetic resources
- Forest cover in landscapes
- Threatened forest species
- Protected forests

Criterion 5: Maintenance and appropriate enhancement of protective functions in forest management (notably soil and water) (Protective forests)

Maintenance and increasing of the protective functions of forests

- Timberline forests
- Protective forests – infrastructure and managed natural resources
- Impacts of forest management on waters

Criterion 6: Socio-economic functions and conditions maintenance of other socio-economic functions and conditions (Socio-economic functions)

Maintenance of the economic viability of forest

- Forest holdings
- Contribution of forest sector to GDP
- Maintenance of the economic viability of forestry
- Public commodities of forests
- Consumption of products of the forest industries
- Exports of the forest sector

Improvement of employment and occupational safety in the forest sector

- Forest sector work force
- Occupational safety and health

Safeguarding public awareness and participation

Research, education and training of forestry

Maintenance of cultural and spiritual values

- Cultural and spiritual values

Evaluating the status of forests

Changes occurring in forests and effects of forest policies are evaluated at the national or large-area level based on the MCPFE quantitative criteria and indicators of sustainable forestry.

The MCPFE indicator set was developed for monitoring and evaluating European forests over the period 1993–1995. They are used, for example in Finland, for monitoring the National Forest Programme and the target programmes of regional forest areas, presenting the status of forests for public use, updating silvicultural recommendations, implementation of forest certification and identifying new research needs.

New information has enabled continuous development of the MCPFE quantitative criteria and indicators and the previous update took place at the European level in 2002–2003. The current indicator set contain six criteria and a total of 35 measurable indicators.

The criteria describe the development of the three main pillars of sustainability of forestry, the ecologic, economic, and social and cultural aspects. The indicators are used to measure the practical outcome of these factors. The largest number of indicators is related to evaluation of forest biodiversity and the social and economic significance of forests.

The data on the state of forests and on development of the forests is attained through national inventories of forest resources. However, information for some of the indicators is gathered by conducting separate surveys and research. Some of the data is gained from various data sources, not necessarily from the statistics and data sources of the forest sector.

The data background for the indicators can be very different in different countries. The reasons may be a lack of resources for organizing measurements, a small amount of forests, or their limited significance in the national economy. Finland's forest statistics are amongst the most extensive in Europe with the longest follow-up periods. Finland's National forest inventory started to follow the development of forest resources in 1921–1923. **JP** ■



Metla/Erika Oksanen



Data collection and data sources for the State of Finland's Forests 2007 report

The report on the State of Finland's Forests 2007 compiles the most recent, objective, quantified and comparable data on sustainable forest management in Finland. The data for the Finnish indicators were obtained from inventories, statistics, monitoring systems and reports.

Appointed by the Finnish Ministry of Agriculture and Forestry, a group of experts representing key players and interest groups in Finnish forestry agreed on the indicators and data sources to be used and on the presentation of the results. The present, third set of indicators was developed by taking into account earlier national experiences and the Pan-European indicators adopted at MCPFE 2003 in Vienna. The collation of data and the production of texts concerning the indicators were carried out at the Finnish Forest Research Institute (Metla), which, being responsible for the compilation of forest statistics in Finland, had the necessary resources for the task.

The data sets on the criteria and indicators (C & I sets) presented were made available by different Finnish organizations. The most important co-operation partners were of course the members of the expert group

from the different expert organizations' says Metla's **Sinikka Västilä**, who was in charge of the data compilation for the report. 'During the data collecting process we worked closely with the Forest Statistics Information Service and several Metla researchers from different research areas, who provided helpful comments during the whole data collection process.' Västilä continues.

The main value of the Finnish report lies in the presentation of a wide range of well documented data on the situation and trends for sustainable forest management in Finland, covering the six criteria "Forest Resources", "Health and Vitality", "Productive Functions", "Biological Diversity", "Protective Forests" and "Socio-Economic Functions".

'Although in most cases the data has been relatively easy to combine and analyze, challenges are still remaining for certain indicators, e.g. "Public commodities of Forests", "Services, particularly of recreation" and "Cultural and spiritual values".' says Västilä and continues 'We also have had many discussions within the expert group on how to present the qualitative indicators concerning the overall policies, institutions and instruments for sustainable forest management.'

As an independent research organization, Metla has shown itself to be qualified in the data collection and analysis for the State of Finland's Forests 2007 report. 'For the next report we have already the necessary experience and know what we have to improve in order to produce an even better result.' says Västilä. **ML** ■

Organizations and institutes involved in the expert group preparing the C & I sets and the State of Finland's Forests 2007 report

- Finnish Forest Research Institute (Metla)
- Ministry of the Environment
- Wood and Allied Workers' Union
- Central Union of Agricultural Producers and Forest Owners (MTK)
- Finnish Forest Industries Federation
- Ministry of Trade and Industry
- Ministry of Agriculture and Forestry
- Finnish Association for Nature Conservation

Data sources of the State of Finland's Forests 2007 report

- Finnish statistical Yearbook of Forestry
Metla's exhaustive statistical overview of forestry and the forest industries in Finland:
www.metla.fi/julkaisut/metsatilastollinen/index-en.htm
- Metinfo forest information service
Metla's information databases on e.g. forests, forest condition and forest resources, silviculture, forest management and forest use:
www.metla.fi/metinfo/index-en.htm
- Finnish legislation information databases FINLEX
The State's information databases on e.g. consolidated legislation, texts of acts and decrees: www.finlex.fi/en/
- Databases of Finland's environmental administration
E.g. information databases on the State of the Environment, Nature Protection, Land use:
www.ymparisto.fi/
- Statistics Finland
E.g. databases on socio-economic information:
www.stat.fi/index_en.html
- Forestry Development Centre Tapio
E.g. information on forest key habitats, impacts of forest management on waters:
www.tapio.fi/ and www.metsavastaa.net
- Databases of the Ministry of Agriculture and Forestry
www.mmm.fi and the Ministry of Trade and Industry
www.ktm.fi
- Scientific publications and reports of different Finnish organizations





Metla/Erkki Oksanen

Forest management affects waters — Metla studies how

Because of the great number of lakes, rivers, small water systems and peatland forests in Finland, issues relating to water systems receive special attention in forest management. Silviculture can increase export of nutrients and suspended solids to watercourses. Recently these exports have decreased because of reduced amounts of peatland ditching and upland fertilisation and improved water protection. On national scale forestry is contributing only a small proportion of the total anthropogenic nutrient loads to watercourses. Metla's research groups working in Joensuu, Rovaniemi and Vantaa produce knowledge about the environmental impacts of forest management and about methods to reduce those impacts. The research covers topics from nutrient and sediment load estimation to effects of tree stand and climate on the water balance of drained peatland forests.

Phosphorus load from forest management practices accounted for about 8% of the total anthropogenic nutrient load in 2004, and the nitrogen load for about 5%. In national scale the greatest impacts of forest management practices that cause nitrogen and phosphorus export to water systems are regeneration fellings and related soil

preparation in upland mineral soils and in peat soils as well as fertilisation. With respect to phosphorus export the most important forest management practice is ditch network maintenance on peatland soils.

'We have to know the benefits gained from forest management and the respective risks to the water bodies. We should plan forestry operations so that we could optimise the incomes and water protection,' says **Ari Lauren**, senior researcher at Metla working at the Joensuu research group. He continues 'In the latest projects in Metla we have developed a calculation tool for assessing nutrient loads caused by forest management practices. This tool, called FEMMA, calculates water and nitrogen fluxes and has been developed by a wide consortium of different research organisation in Finland. Different modelling tasks are presented at our FEMMA Website. A follow up of this project will start in 2008.' 'Evaluating the risks and the benefits of a forest operation can lead to such a decision that we don't do a certain management at all, e.g. if forest ditch maintenance does not improve the forest grow at all than we have only risks of increased loads of nutrients and suspended solids. Doing nothing is the best water protec-

tion in that case,' says Lauren. Nitrogen load from forestry has decreased in Finland as a consequence of the decrease in drainage projects. In Finland about 4,9 million hectares of peatlands have been drained. No first-time ditching is taking place anymore but the maintenance of those ditched networks is the most important forest management practice that influences the export of suspended solids. 'What is not now known and can only be slightly estimated is that what happens when this peatland stands come to regeneration phase. It is very possible that in the future the regeneration of peatlands areas will increase the total load,' says Lauren.

In nutrient fluxes of a forest stand only a minor portion of the fluxes is actually lost to water body. With respect to nitrogen flow the annual uptake of Nitrogen of tree stands can be something 40-50kg per hectare per year and the amount lost to water bodies 1 kg per hectare. Deposition of nitrogen in Finland is every-

where bigger than that escaping to the water body. No matter in which phase the forest stand is it retains nitrogen with respect to deposition. In this sense, forest cleans the deposition. However, if the water systems are nutrient limited also a small increment of nitrogen or phosphorus export increases the production of algae there then it is relevant. Forestry is known to increase nutrient concentration in groundwater, but the concentration is far from the critical limits. Forestry management in groundwater areas should be done with caution, because groundwater areas are nationally very important and they have a big significance for the society.

'Researching the influence of forestry on water systems requires long term studies, therefore Metla is a suitable institute for this work. The strengths of Metla in field work and modelling is that we do the work from the perspective of forests

which is not the case if we use other modelling tools that might be available. We can customize these models to mimic the practices and environmental conditions that we find in Finland. In Metla, we can set our research aims far and high enough,' says Lauren and continues 'The key issue is to improve our knowledge of the processes behind the nutrient and suspended solid exports. So far those processes are not known in detailed enough. When we know how nature functions, we can create effective methods to mitigate the environmental impacts of forestry operations. **ML** ■



Metla/Erkki Oksanen

List of current projects at Metla related to research on the impacts of forest management on waters:

- HAME – Prediction of nutrient and sediment load from forestry catchments – development of competition tools (starting in 2008) Project leader: Prof. Leena Finer, Metla Joensuu
- VIRTIA – Fluxes of elements in boreal forest ecosystem after forest managements
Project leader: Dr. Sirpa Piirainen, Metla Joensuu
- Effects of tree stand and climate on the water balance of drained peatland forests
Project leader: Dr. Hannu Hökkä, Metla Rovaniemi
- Dissolved organic nitrogen dynamics in boreal ecosystems as influenced by soil food webs (starting in 2008)
Project leader: Dr. Ari Lauren, Metla Joensuu
- Tree production and water protection after maintenance of ditch networks
Project leader: Martti Vuollekoski, Metla Vantaa
- The cost effective method of forest water protection
Project leader: Martti Vuollekoski, Metla Vantaa
- The risk of leaching from ash fertilized peatlands
Project leader: Dr. Sirpa Piirainen, Metla Joensuu
- The effect of FeSO₄-containing PK-fertilizer on phosphorus leaching and tree growth on an ombrotrophic pine mire
Project leader: Dr. Mika Nieminen, Metla Vantaa

National project partners:

Finnish Environment Institute (SYKE), Geological Survey of Finland (GTK), University of Joensuu, University of Helsinki, University of Oulu, Helsinki University of Technology and Forestry Development Centre Tapio

International project partners:

Nordic forestry CAR-ES
European partners of COST Action FP0601: Forest Management and the Water Cycle (FORMAN)

More information at: www.metla.fi/index-en.html

More information about FEMMA at: www.metla.fi/hanke/3383/femba/index-en.htm

芬兰森林研究

Metla increases cooperation in Asia

Metla on the Lookout in Asia

Anne Luhtala

From the forest industry point of view Asia has become a remarkable market area where both the consumption and production of forest products grow rapidly. It is natural that one of the aims of Metla's new strategy for international activities is to increase cooperation in Asia. Metla's Director General, **Hannu Raitio** visited China, Japan and the Republic of Korea recently. Although Metla has already been involved in scientific cooperation with Asia, an official visit of Metla's Director General to the important forest research organizations in three Asian countries is a new strategic action that aims at opening doors to a substantially wider spectrum of cooperation.

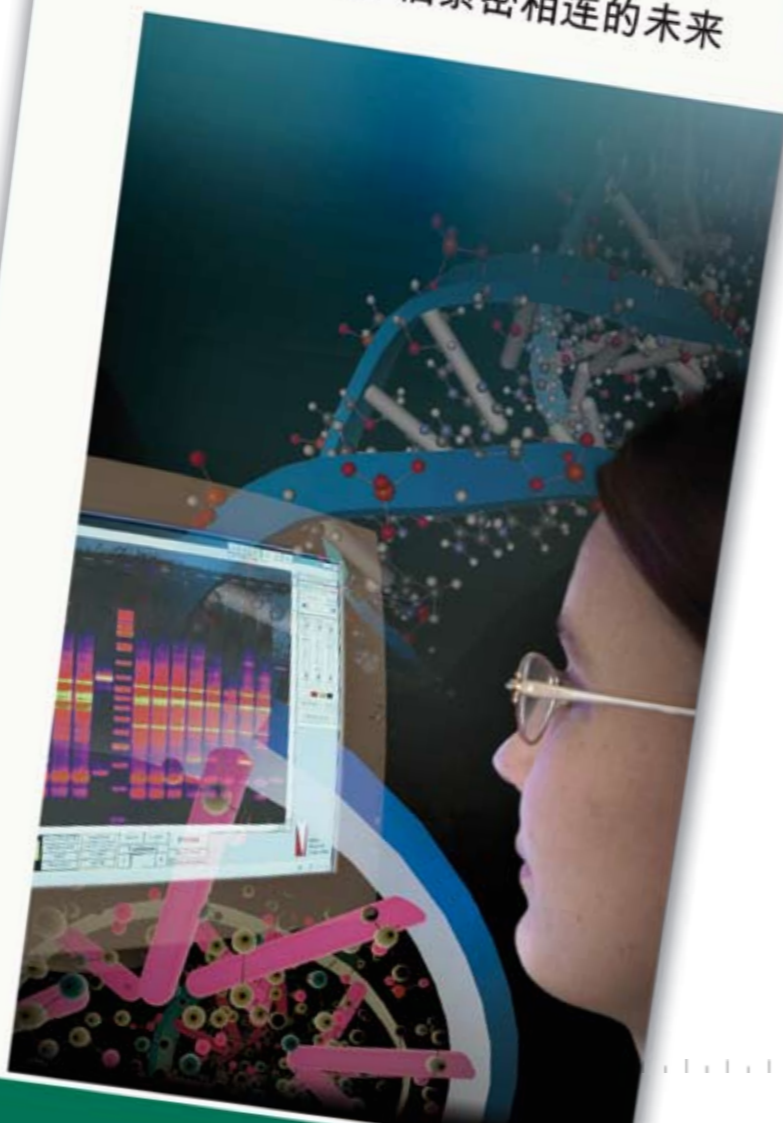
Metla's cooperation with the People's Republic of China

There are 197 million hectares of forests in China. This is eight times more than in Finland, but still, the proportion of the total area of the huge country represented by forests is only 21%. China aims at increasing its forest area and annual forest plantations have amounted to four million hectares.

In 1987 a severe fire destroyed forests covering almost 900 000 hectares in Northern China. Metla's scientists were invited to study the possibilities for reforestation and use of modern forest technology in the burned area. The results of the survey were published in 1991. As a continuation for this project Metla's biggest cooperation project in China, known as the 'Hebei Project', started a few years later, in 1993. The Hebei Project, named according to the Chinese region in question, was actually a broad Finnish-Chinese programme that included several sub-projects such as model forest. Even preconditions for the establishment of a pulp and paper mill were studied. Metla's role in the programme was to adapt methods used by the Finnish National Forest Inventory to Chinese conditions. In addition to these projects Metla's researchers have had smaller-scale cooperation with Chinese scientists on, e.g. peatland forestry, forest economics and forest tree breeding. At

Metla increases cooperation in Asia

METLA
芬兰森林研究所
通过我们的研究创建一个
森林与人类幸福紧密相连的未来



Metla/Erkki Oksanen

▲ A Chinese delegation getting acquainted with forest inventory methods in Finland in 1987.

the moment Metla is carrying out a research project with the University of Harbin on how trees react to environmental, especially climatic, stress.

During his visit to China in May 2007 Hannu Raitio had thorough discussions with Prof. Shougong Zhang, President of the Chinese Academy of Forestry, CAF, and a Memorandum of Understanding (MoU) was outlined. The MoU, which was signed during a reciprocal visit from CAF to Metla in November this year, lists several topics of joint interest.

CAF has nine research institutes, four experimental centres and three research and development centres located in ten provinces of China. The research interests of CAF cover versatile forestry-related topics including basic and applied research. The number of its scientists and technicians exceeds 1600, which makes Metla - the biggest forest research organization in Europe - look small!

Most of Metla's cooperation with China has been included in the cooperation plan of the Sino-Finnish Working Group for Forestry, which for more than 25 years has listed topics of joint interest at the ministry level. It will also provide important

◀ Metla's brochure in Chinese.

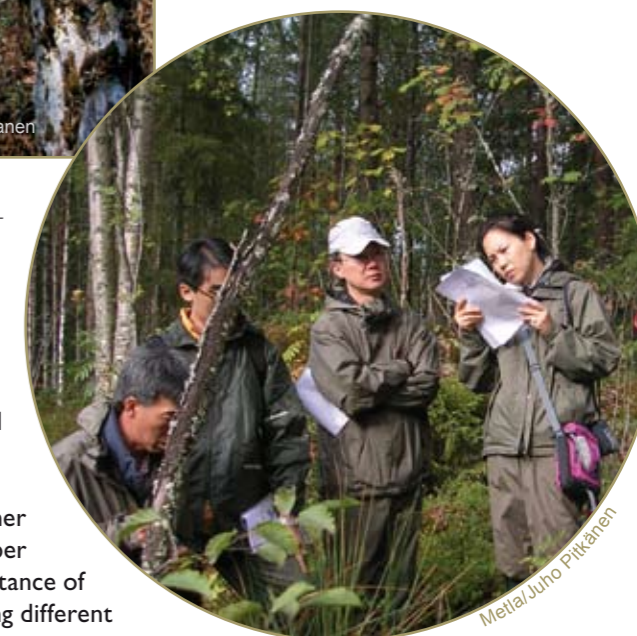
support for Metla's cooperation with China in the future. Valuable support was also offered to Metla by the Ambassador of China, H.E. Ms. Ma Keqing, who during her visit to Metla in September 2007, promised the assistance of the Embassy in contacting different partners in China. Good contacts are a precondition for successful cooperation in all the Asian countries.

Metla's Cooperation with the Republic of Korea

Korea has 6.4 million ha of forests covering 65% of the total land area. More than 40% of the forests consist of coniferous trees. A big part of Korean forests was destroyed during and after the Korean War. Owing to extensive forestation plans the forests have increased by more than two million hectares since 1973.

The Korea Forest Research Institute, KFRI, is the main national institute in the field of forest and forestry and forest products and it plays a leading role in developing forest-related sciences in Korea. Metla has earlier had cooperation with KFRI especially on forest inventory issues. This cooperation will

continue in the future and concrete actions will take place still this year. In addition, a Metla scientist on forest economics has been a Visiting Professor at the Seoul National University. The recent discussions in Korea of the directors of Metla and KFRI, Hannu Raitio and Kwan Soo Chung, confirmed the understanding that there are several joint interests that may be further developed. During his visit Hannu Raitio had the opportunity to visit also the Forest Practice Research Center, FPRC, Korea National Arboretum, and the Seoul National University.



Metla/Juho Pitkanen

▲ Korean forest inventory scientists in a Finnish forest in 2006.

Metla's Cooperation with Japan

The share of forests in Japan is 68% of the total surface area. The northern parts of the country belong to the boreal climate zone and the southern parts to the sub-tropical zone. More than half of the cuttings come from planted forests. Since the 1960's the government has placed strong emphasis on forest regeneration and the growing stock has increased from 1 900 million m³ to 3 500 million m³.

The Forestry and Forest Products Research Institute, FFPRI, was established as early as in 1905. A big structural change in FFPRI took place this year when the Forest Tree Breeding Center was combined into it. ▶▶



▲ Metla and the Forestry and Forest Products Research Institute, FFPRI, signed a co-operation agreement in Japan in October 2007.

Today FFPRI has the status of an 'incorporated administrative agency' where the amount of researchers is 500. In addition to its headquarters in Tsukuba, close to Tokyo, it has six research centres, four breeding centres and scientific gardens located in several parts of Japan.

So far Metla has not had big joint research projects in Japan, but occasional cooperation activities have been carried out. Since 1990 Metla's researchers have had more than 50 articles either published in Japanese publications or co-published with Japanese authors. The publications have dealt with wood procurement, insect damages, forestry planning and wood products marketing. In 2006 Metla researchers visited FFPRI and three forest universities and many potential cooperation topics were found.

Metla's delegation, led by Director General Hannu Raitio, had discussions with Director General of FFPRI, Kazuo Suzuki, in Japan in September 2007. The discussions resulted in the signing of a Memorandum of Understanding. Based on this MoU several cooperation initiatives will be developed in a near future.

Valuable support for Metla's Japan contacts is offered by the Finnish Institute in Japan, whose director, Heikki Mäkipää joined the recent visit of Metla's delegation. In autumn 2008 the Institute will arrange, together

with the University of Oulu in Finland, a seminar in which Metla will be involved. The topic of the seminar concerns boreal forests' management.

What Next?

Metla has recently revised its international strategy. The strategy recognizes that Metla has a very strong position internationally in certain research fields, e.g. in forest inventory and monitoring of forest ecosystems. It is also one of the leading specialists on Northern boreal forests especially on production ecology and material flows, as well as silviculture and harvesting chains. Metla aims at maintaining its leading position in these fields in which it has also a lot that it can contribute to the benefit of its Asian counterparts.

There are other fields of research where Metla is strong from the international point of view, but the aim is to become still stronger. Bioenergy from forests and the knowledge and use of wood-material properties are examples of these topics where combining the knowledge could bring excellent results.

A third strategic group includes topics where Metla needs international cooperation to strengthen its present position. Societal acceptability of forestry and the environmental capacity of wood-based products are examples of these topics. Also within

this latter group belongs the topic of forests and human health, a topic where the countries especially in Asia are far ahead of European countries.

Alongside the above-mentioned general strategic aims of Metla, the individual topics for cooperation have to be defined separately with each organization. For this purpose a Memorandum of Understanding is a good tool giving a backbone for the future activities.

Every new attempt in international activities needs input of time and money. A relatively easy way to get started is the exchange of scientists. The mobility of researchers is supported by the European Union through its People (Marie Curie) programme. It enables mobility not only within Europe but also between Europe and other continents, including Asia. A few years ago the Academy of Finland together with Finnish Funding Agency for Technology and Innovations, TEKES, launched a new programme called Finnish Distinguished Professor, FiDiPro, to recruit distinguished researchers from abroad to Finland. The applications to this programme are made together with the candidate scientist and the host organization in Finland. From the point of view of the Finnish-Asian cooperation, it is promising to see that there are more and more Asian scientists in the FiDiPro applications. These and other channels for funding are available for the mobility of researchers in Metla and the Asian organizations.

Funding does not need to be an obstacle to cooperation, so long as the most important precondition - a joint scientific interest - exists. In this respect we feel that a step forward has now been taken and Metla is looking forward to a successful Asian cooperation. ■

Meet in the forest

Snow - a mixed blessing

Finland is located high up in the north, probably much more so than you think. The southern coast is 60 degrees north. In the Americas it is the same latitude as Hudson Bay. Therefore we are a real snow country in winter.

When you ski or walk in the forest, with a fresh feathery blanket of snow covering everything, it absorbs all the sounds and creates a curiously muffled sensation. During the many wars in our history, Finnish troops hid in the snow in their white overalls like winter rabbits, often to the demise of the enemy.

For the Northern people snow in its various forms has always been important. It is often said, boasting, that in Greenland they have seven different words for different types of snow. This must be a misunderstanding, for in the Finnish language alone we have hundreds of them. Every language born in a snow country does.

From the forestry point of view snow is a mixed blessing.

On the one hand it protects the young trees, soil and forest animals from the sometimes extreme cold during the long winter, while on the other it can crush the trees under its load. Especially in the Northern parts of the country a sticky form of snow and ice (in Finnish "tykky") may accumulate in such quantities that it causes rather extensive damage.

The ongoing climate change will make the winters shorter throughout the whole country. In the Southern parts it will mean less snow. In the north however, the thickness of the snow cover may even increase.

At first sight snow and ice may appear to be an obstacle for forestry, but in fact it has been quite the opposite. In Finland more than one third of the forestry land is peatland that are wet and soft in summer. The icy winter hardens the surface making it accessible for harvesters. Now that the period of winter frost appears to be shortening, new harvesting methods are needed.

Winter ice and snow have also formed a barrier against many pests from warmer latitudes. Now that the arctic cold is loosening its grip, they are probably just waiting for a chance to strike. The forestry scientists will have to be on their guard in the future. EK ■

◀ Under the burden of heavy snow, icy ground may break up so that eventually the tree falls down.



Metla/Erkki Oksanen

Finland's National Forest Programme 2010 –

Future challenges and the role of research

Forest programmes have played an important role in Finland both as an instrument of forest policy and in the provision of funding for forestry. The latest National Forest Programme 2010 (NFP) was adopted by the Government in 1999. Its priorities are to secure employment and livelihoods based on the use of forests, the biological diversity and vitality of forests, as well as their recreational benefits.

'One of the essential goals has been to ensure that the NFP complies with international agreements and to build synergy with international initiatives and conventions on forest-related issues. Since 1999 the NFP work has been based on international forest policy development and its consequences to Finland. This working group has introduced the information on regulations and agreements that must be complied with, and as an equally important responsibility, acquired and disseminated the national policy definitions to the international processes.' says **Marja Kokkonen**, Secretary-General of Finland's National Forest Programme working at the Finnish Ministry of Agriculture and Forestry.

The NFP 2010, a continuation of previous forest programmes, is seen as clearly more extensive in scope as it takes into account the economic, ecological, social and cultural aspect of sustainable of forest management. The NFP 2010 is integrated to the national strategies of sustainability, such as the strategy for biodiversity and the strategy for sustainable development.

Aims that have been achieved so far

The NFP has stabilized its position as a decision-making tool for Finnish forest policies. The broad-based stakeholder participation in preparations and implementation commit both public and private sector players and social and environmental partners to the objectives and actions. As a whole, the programme has functioned well. Financial support systems and investment into silviculture, forest based energy as well as employment in the forest sector have developed according to NFP 2010. ►►



Metla/Erkki Oksanen

▲ The Metla House in Joensuu is an outstanding example of timber construction in Finland and the use of domestic wood.



Metla/Erkki Oksanen

▲ Excursions as a efficient way of disseminating information and participating in the management of common forest issues.

‘Employment in the forest sector has developed more favourably than predicted during the drafting of the NFP. The good situation with respect to employment is due to increased silvicultural work, increased use of forest based energy and the employment stability within the wood products industries. The use of forest energy has increased according to the set target, domestic demand for wood products has increased extremely rapidly: the Finnish consumption of wood industry products is approximately one m³/person/year, which is a European record.’ says Kokkonen. She continues ‘Cooperation between R&D and training activities has become closer. Examples of the related development decisions include the Council of State policy decision on the renewal of the public research system, the research strategy for the Finnish forest cluster, and the concentrations of expertise into centres of excellence for the forest cluster.’

Shared sub-programmes like the

“Programme for promoting the use of wood products” and the “Forest Biodiversity Programme for Southern Finland” (METSO) have been shown to bring results. The aim of the METSO programme was to improve the maintenance of habitats and structural features of forests vital to the survival of endangered species. New areas and networks of areas that support forest biodiversity were created, and the biodiversity of existing conservation areas is improved. The principles of new protection methods are voluntary participation by forest owners, preservation of ownership and full compensation of economic losses.’ During the programme, new voluntary means were tested to improve forest biodiversity and based on this voluntary participation, the actual biodiversity programme, METSO II, is now being planned for execution over the period 2008–2015.’ says Kokkonen

‘Additional activities are still required to increase the use of domestic wood and to increase the value of

exports of forest industry products. The quality of silvicultural and forest works that had long been favourable came to a stop in 2005, when there was a drop in the volumes of seedling stand management and ditch cleaning. Based on the National Forest Inventory completed last summer, the silvicultural status by the treatment of young forests has become lower, so the amount of work should be considerably increased. Furthermore, additional efforts are also needed to advance the recreational use of forests.’ says Kokkonen.

The NFP 2015 and future challenges

A new National Forest Programme NFP 2015 is under revision. The aim of NFP 2015 is to respond to the changes in the operational environment of the forest sector by focusing efforts on renewing the forest sector. As different from NFP 2010, the new focus will be increasing the benefits of forests from the point of view of climate change and renewable energy

resources. The importance of international and EU policies for the forest sector will continue to increase. This requires that coordination work must be arranged more effectively and that intersectoral preparative work has to be strengthened.

‘The current challenges in the NFP work include having to finalize the NFP 2015 so that the different forms of forest use can be reconciled into a harmonized entity.’ ‘More forests will be needed for producing timber for the forest industries, for natural conservation purposes, for recreational purposes and in the future, also for use as carbon sinks. Products based on forests and wood should also be more client-based to maintain the forest sector’s competitiveness.’ says Kokkonen and continues ‘Structural change in the population and at the same time in forest owners, (aging, urbanization, occupational changes) will entail several changes. Attitudes and needs should be taken into account in the general approach to the setting of forest policy as well as in activities in practice. The availability of labour for forestry work is seen already a problem.’

Successful communication is also seen as a challenge. How can we succeed in broadcasting the importance of forestry and the approach to forest policies in a manner that is understandable for all? And how can we ensure that the players in the forest sector are sufficiently informed on the perspectives of the citizens and the various stakeholders?

Role of forest research in the NFP

The role of research in the NFP Kokkonen sees as multifold: ‘The role of research is very important also in anticipating the needs of development for the operational environment and the NFP process. At the planning phase of the programme, research consists of providing analyses on changes in the operational environment, scenarios and alternative calculations and proposals for implementation. At the implementation phase, research results will be utilized in, for example, development of legislation,

forest management instructions and technologies, and research and development programmes will be carried out in the key priority areas defined in the NFP. To support monitoring, research will produce statistics and indicator data. Independent, third party research institutes, selected based on a call for tenders, will evaluate the programme (ex ante, interim and ex post evaluation).’

How well research can be deployed at the different phases of the NFP will depend on the level of independence and expertise of research, the analytical quality and intersectoral approach of research and its capability to generate new initiatives. Paying close attention to practical needs during the planning of research and putting the research results into practice are both important for the

implementation of the programme. Improving the utilization of research is part of the NFP development.

ML ■

More information on Finland’s National Forest Programme: www.mmm.fi/en/index/frontpage/forests/nfp2010.html



▼ Wood is an important raw material for producing energy for heating, especially in population centres in rural areas in Finland. The photo shows a local heating plant using wood chips.

The priorities of NFP 2015

- Being alert to the needs of the forest industries and forestry to remain competitive
- Increasing forest-based benefits for climate and energy
- Ensuring biodiversity and environmental benefits
- Promoting forests for cultural and recreational activities
- Strengthening expertise in forestry
- Advancing sustainable forest management and practices in international forest policies



Metla/Erkki Oksanen

Spotlight



Metla/Markus Lier

Questions to Dr. Lu-Min Vaario researcher at Metla

Working at Metla are researchers from as far away as China. Dr. Lu-Min Vaario, a forestry expert with a scientific background in China and Japan, has been working at Metla in Vantaa for the past year. She describes Metla as a concentration of expertise in many traditional areas of forest research.

Q: Why did you decide to come to Finland and why to Metla?

V: I came to Finland for family reasons in 2005. I am originally from Shanghai, China, though I left my home town in 1988 to study forestry at the University of Tokyo, Japan. I went back to China for about four years after completing my postdoctoral work in 2001. So I have managed to acquire a fairly diverse academic background from several countries.

In Finland I wanted to continue my forest research career and Metla was my natural first choice. I already knew that Finland has a leading position in the field of forest science. I started out by being involved in a joint project between the University of Helsinki and Metla.

Q: In which project are you involved at the moment?

V: Presently I am involved in the project, 'Forests 2050' that is part of Metla's research program, Functioning of forest ecosystems and use of forest resources in changing climate, which started this year. The research program aims at producing information on the impact of climate change on growth, health and biodiversity of boreal forest ecosystems and the influences on the whole of society. Apart from the mitigation actions, it is also important to take actions to adapt the forest sector to the anticipated changes. The mitigation and adaptation actions will reflect on the international policy and the course of the forest sector, with increasing needs to take climatic issues into consideration when making decisions on forest policy. Furthermore the program is going to produce information in support of the greenhouse gas reporting dealing with forests.

In this research project, my task is to get biological information on the variation in the growth of seedlings, and variation of various important leaf and root characteristics caused by climatic and environmental stresses, mainly focusing on saline stress and oil pollutant, and to characterize the role of mycorrhizas in salt toleration. We will especially study the reactions on a population scale using greenhouse studies, and establish a testing protocol for tolerant plant species or genotype selection. Following this greenhouse study, we are also planning to consider these reactions for a long term field scale study in China in the near future. The methods to be used in this study will include measurement of the growth of seedlings and net photosynthesis, measurement of mycorrhizal colonization and morphotypes, analysis of ion content of plant tissues.

In my research project I have been working very closely with Dr. Pertti Pulkkinen, the leader of this project, and colleagues from Metla's Units in Suonenjoki and Vantaa as well as from the University of Helsinki. I have had also the chance to visit several research groups at other Metla units during the past year in order to get a close-in picture of the research being conducted.

Q: How would you describe Metla as an employer?

V: Actually, I think that Metla provides a very good research platform for researchers. Here, I am working with excellent office facilities, laboratory facilities, training system and lab management. Most of the people speak good English, which makes it easy for a foreign researcher to start to work here.

Q: The state of China's forests...

V: Due to the rapid industrialization over the past years and limited natural resources we are facing at the moment several environmental problems in China such as air and water pollution and desertification. International cooperation is necessary in order to minimize the impact of these problems.

We know that many countries are supplying China with primary and secondary industrial wood products. The assessment of the global impact of the booming consumption of forest products in China and the identification of suitable measures to mitigate the negative effects have been considered in many western countries. At the moment the Chinese forest industry is facing the challenge of security of wood resources. The productivity and quality of forest resources in China remains low or is even decreasing. Exploitable mature timber resources have been exhausted.

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At the moment the Chinese forest industry is facing the challenge of security of wood resources.

The government congress of China decided in 2007 to put more effort into the protection of the environment, including forest resources. During the period of the Five-year Country Plan, the government allocated appropriate funds as high as 700 billion RMB (about 70 billion Euro), accounting for 1.3% of GNP. Now, the loss caused by the environment problems each year is approximately 320 billion RMB (about 32 billion Euro). In addition energy security is another major problem in China.

China has made mistakes in the 50's and 60's by cutting down forests to create agricultural land. According to the latest FAO statistics the cover of forests on the total land area has grown during the last years due to afforestation measures. This afforested area, mostly timber plantations, is covering land that was originally wasteland and highly susceptible to erosion. According to FAO the amount of forest land as a proportion of the total land area was in 2005 about 21%. The area of forest is, of course, still a really small area if we compare it with Finland's 76%. Anyhow there has to be more awareness in China that forests are a long-term investment. ▶▶

Q: Challenges of Chinese forest science...

V: This is difficult question because there are various challenges depending on the science area of forestry. If we just consider some examples, I would say that the restoring of forest ecosystems is one of the biggest challenges for Chinese forest science. This is a long-term task, which is directly connected to environmental issues. Although, for example, the area of forest is increasing, it does not necessarily follow that there is a rise in forest diversity. Chinese science, maybe not only forest science, is facing an educational challenge as well. We have to teach long term thinking.

If you compare it to Finland I would say that studying forestry it is not popular in China. But if we look at the numbers than one could think it is popular. In China we have five major forestry universities, and at Beijing Forestry University alone there are more than 20,000 forestry students

Q: Where would you see the need for collaboration between Chinese forest researchers and Metla?

V: After one year at Metla I can already see clear benefits in the way forest research is conducted here. In Finland projects are very well planned from beginning to end. Projects involve large scale sampling and analysis to gain as much, and as detailed information as possible. Research is done with patience, and in this forest researchers in China could learn something from Finland and Metla. Metla has expertise in many traditional areas of forest research. Finnish forestry specialists are really needed in China e.g. in providing their expertise in forest managing and forest monitoring. We have to remember that only detailed planning and a long-term approach will produce reliable results.

ML ■

More information on Metla's research program 'Functioning of forest ecosystems and use of forest resources in changing climate' at: www.metla.fi/ohjelma/mil/index-en.htm

Resume, Lu-Min Vaario

Academic degrees

- 1984 graduated from Department of Biology, Shanghai Normal University (China)
- 1992 Master's Degree from Graduate School of Agricultural and Life Sciences, University of Tokyo (Japan)
- 1996 PhD from Graduate School of Agricultural and Life Sciences, University of Tokyo (Japan)

Academic employment

- 1984-1988 Researcher at Institute of Ornamental Horticultural Science (China)
- 1988-1990 Visiting researcher at Nippon Medical School (Japan)
- 1992-1994 Researcher at Sumitomo Forestry Co. Ltd. (Japan)
- 1997-2001 Postdoctoral researcher at Graduate School of Agricultural and Life Sciences, University of Tokyo (Japan)
- 2002-2003 Associate professor at the Chinese Academy Science, Institute of Botany (China)
- 2004-2005 Technical expert at CCPIT Patent and Trademark Law Office (China)
- 2002-2006 Invited professor position at the Northeast Forestry University (China)
- Since 2006 Researcher at Metla

Finland's National Forest Inventory – Ecological measurements and future challenges to come

Finnish forest research organizations have created systems for monitoring the state of forests and forest management. This work has embraced National Forest Inventories, forest statistics, the forest condition monitoring programme (Forest Focus), the Finnish biodiversity information systems, and the evaluation of nature management in commercial forests. The majority of these monitoring systems are the responsibility of the Finnish Forest Research Institute (Metla).

Finland's National Forest Inventory (NFI) provides information about the development of forest resources and the state of forests. The first systematic inventory of Finnish forests was conducted as far back as in 1921–1924, and as a result Finland has a long time-series on the development of forest resources.

In the current, 10th NFI, which started in 2004, about 60 000 sample plots covering the whole of Finland are measured. 'We plan to start the new NFI immediately after the 10th NFI in 2009 and complete it by 2013,' says **Kari T. Korhonen** from Metla, responsible for the current NFI. He continues, 'We do not expect big changes to come in the NFI system.'

Ecological measurements were already included in the 9th NFI in response to the growing needs for information on environmental management. These variables include dead wood, mapping and evaluation of valuable biotopes, recording of valuable tree individuals and improved descrip-

tion of species diversity of the growing stock. Dead wood is measured and damage, including insect damage, is recorded at stand and at tree level on all plots. 'We are trying to improve our measuring instruments to make the work more efficient. We have to look at how we can replace some of the subjective observations with more exact measurements. Since Forest Focus is ending we are integrating forest health monitoring and NFI more closely,' says Korhonen.

Finland's NFI is continuously under development in order to meet the information needs of practical forestry. 'We must be able to observe significant changes in forests and forest management practices in time,' Korhonen stresses. New forest management guidelines give more flexibility to forest owners in their management operations. NFI is one tool to monitor how these guidelines are applied in practice.

One future challenge of Finland's NFI is to strengthen the cooperation

between different NFI organizations in European countries. The networks of COST E43 and ENFIN are very important tools that aim to improve and harmonize the existing NFI's in Europe. Inventories have to meet national, European and global level requirements in supplying up-to-date, harmonized and transparent forest resource information for decision making, and to promote the use of scientifically sound and validated methods in forest inventory designs, data collection and data analysis. 'At the same time, we have to be able to maintain our long-term time-series from Finland's NFI. The new information must be comparable to the old existing information,' says Korhonen and continues 'There is lot of work to be done before we have harmonized even the basic concepts.' ML ■

More information on the current NFI at Metla's website: www.metla.fi/ohjelma/vmi/vmi10-info-en.htm



Metla/Erkki Oksanen

Some upcoming events at Metla or organised by Metla/partners



SNS - Nordic Forest Research Co-operation Committee

Scandinavian Society of Forest Economics, SSFE Biennial Meeting 2008

Time: 6.04.-10.4.2008

Place: Brimiland and Lom, Norway

Organised by: SNS

More information at:

www.nordiskskogforskning.org/sns/en/index.html

Forest recreation & tourism serving urbanised societies

Time: 28.-31.5.2008

Place: Hämeenlinna, Finland

Organised by: Metla, IUFRO, EUFORIC

More information at:

www.metla.fi/tapahtumat/2008/recreation-tourism/

IUFRO WP 5.01.04 Wood Quality Modelling

Time: 8.6.2008

Place: Koli, Finland

Organised by: Metla, University of Joensuu, IUFRO

More information at:

www.joensuu.fi/metsatdk/IUFRO2008/index.html



Wood Energy Solutions

Time: 3.-6.6.2007

Place: Koli, Finland

Organised by: Wenet, Metla, North Karelia University of Applied Science, EFI

More information at:

www.wenet.fi/eng/cfmldocs/index.cfm?ID=1339

IUFRO 3.08 Small-scale Forestry conference: Global Policies versus Local Knowledge

Time: 23.-27.06.2008

Place: Gerardmer, France

Organised by: IUFRO, EFI

More information at: www.iufro.org/events/calendar/

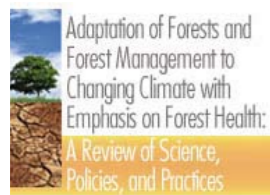
Adaptation of Forests and Forest Management to Changing Climate with Emphasis on Forest Health

Time: 25.-28.08.2008

Place: Umeå, Sweden

Organised by: IUFRO, SLU and FAO

More information at: forestadaptation2008.net/



Metla's publications

Research results and other forms of expertise are published in Metla's scientific journals, other publication series, monographs and in articles and scientific posters. In addition, the research results are also frequently presented in media releases, newspaper articles as well as various seminars and conferences.

More information at: www.metla.fi/julkaisut/index-en.htm

Metla publishes two scientific journals (published jointly with the Finnish Society of Forest Science), the **Metsätieteen aikakauskirja** and **Silva Fennica**.

Dissertationes Forestales – series for doctoral dissertations in forest sciences and related disciplines published jointly with the Finnish forestry faculties and the Finnish Society of Forest Science.

Working Papers of the Finnish Forest Research Institute publishes preliminary research results and conference proceedings.

Statistical publications – **Statistical Yearbook of Forestry, Forest Statistical Bulletins, Forest Finland in Brief**, and national reports on forest condition monitoring in Finland – include diverse statistical information on forests and forestry.

The Finnish Forest Sector Economic Outlook is published annually.

Statistical Yearbook of Forestry 2007

The Statistical Yearbook of Forestry provides an exhaustive statistical overview of forestry and the forest industries in Finland. The book covers the Finnish forest sector as a whole, ranging from forest resources to international trade in forest-related products.

The Statistical Yearbook of Forestry is published annually in the beginning of December. All figures and tables are also available in English at:

www.metla.fi/julkaisut/metsatilastollinenvsk/index-en.htm

Chapters

- Forest resources
- Forest health and biodiversity
- Silviculture
- Roundwood markets
- Harvesting and transportation of roundwood
- Multiple-use forestry
- Forestry sector's labour force
- Wood consumption
- Forest industries
- Foreign trade by forest industries
- Forest sector in Finland's national economy
- International forest statistics



METLA

FINNISH FOREST RESEARCH INSTITUTE

Established in 1917. The biggest forest research organization in Europe, with more than 900 permanent employees and a network of research centers all over the country and numerous projects and partners worldwide.

Mission: To build the future of the forest sector by producing and disseminating information and knowhow for the well-being of society.

Core values: reliability, occupational skills, competence and well-being, interactivity, proactivity and creativity.

We anticipate future needs for information and develop our practices with an open mind and without prejudice.

Strategic objective: We conduct research and development activities that have high scientific standards and positive impacts aimed to enhance sustainable use of forests as well as economic competitiveness of the forest sector.

Our research priorities:

- 1) Forest-based enterprise and business activities
- 2) Social impact of forests
- 3) Structure and functioning of forest ecosystems
- 4) Information databanks on forestry and the forest environment

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