Editor’s summary

The following is the editor’s condensed summary of the articles in the current issue.

Photo: Skogforsk

How beautiful is a clear-cut?

● In *Salix* plantations, differences in spring frost tolerance have been observed among varieties. **Mattias Lennartsson** and **Erling Ögren** investigated the extent of clonal variation in dehardening. They found, amongst several other things, that most clones were hardy enough to withstand such frosts until a few weeks before budburst. Thus, timing of budburst seems to be explained by the variation in spring frost damage.

● Hybrid aspen is another fast-growing cultivar used in Fenno-scandia. The aspen clones need to be reproduced by vegetative propagat-ion, and the rooting success of the propagation strongly influences the profitability of hybrid aspen forestry. **Niina Stenvall** and her colleagues evaluated the success of propagation with root cuttings, and the effects of genotype, age and treatment of the stock plants. Based on the results, two-year-old stockplants should be preferred to one-year-olds, and selection of clones that propagate easily can significantly improve the economic returns of propagation.

● Grey mould is the most widespread disease in forest nurseries, especially in those with containerized seedlings. It is also targeted by many of the fungicides spread in nurseries. However, grey mould may also be combated by biological antagonists. **Kristof Capieaue** and his colleagues evaluated the potential for biological treatments to counter the fungus. They found that certain commercial products could reduce the disease as much as the common fungicide Euparen.

● Hybrid larch grows slightly faster than Norway spruce, over a full rotation. However, the larch grows much more rapidly when young. At 35 years, a spruce stand has produced only 60% of the yield in comparable hybrid larch stands, according to a survey of 28 hybrid larch plots in southern Sweden. **Per Magnus Ekö** and his colleagues constructed a growth model based on the plots.

● Fertilization of lodgepole pine trees in early spring is not as efficient as fertilization in the summer, probably due to the low soil temperatures and low root activity of the trees in spring. **Isaac Amponsah** and colleagues studied nitrogen uptake in lodgepole pine seedlings to discover when fertilization is likely to be most efficient. Summer fertilization under moist and humid conditions is recommended.

● Nitrogen fertilization of Norway spruce and Scots pine has been practiced on a large scale for several decades in Sweden. The immediate effect of the fertilization lasts for 7–10 years, but its long-term effects on tree growth have not been studied before. **Folke Pettersson** and **Lars Högbom** analysed spruce and pine experiments for which growth data were available extending 14–28 years after fertilization had ceased. Both negative and positive long-term effects of fertiliza-tion were found, but on average they were positive. The authors conclude that there is little or no risk in operational forestry of a “hang-over” after the immediate fertilization effect has declined.

● The limited scenic appeal of a clear-cut can be improved by leaving retention trees, according to **Susan Tönnes** and her colleagues. They asked a large group of respondents to rate digitally edited images of clear-cuts, and concluded that clear-cuts with mature, healthy retained trees improved the scenic quality. However, retained trees of poor quality did not improve the visual appeal, even compared to a clear-cut without any trees.

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Forest research in north-western Russia – Arkhangelsk. 290–291

Forest research in northwestern Russia

News and Views has run a series of articles in which we have outlined forest research in the Nordic countries and the Baltic states. The time has now come to spotlight northwestern Russia, starting with the Arkhangelsk region.

Re-organisation

In 1999, an effort was made by the European Forest Institute (EFI) to describe forest research in Russia and to estimate research capacities. Many of the conclusions reached by the study are probably still valid. The authors stressed the difficulties involved in accessing the necessary information in countries where the economy is rapidly changing. The available information is scarce, and seldom updated.

Traditionally, the former USSR was regarded as one of the leading countries in science and research, especially basic research. Since the collapse of the USSR, the status of Russian science has changed dramatically.

Russian science used to be totally dependent on public funding. In contrast to the western countries, there were no other financial sources that could compensate for the loss when the public spending was cut.

According to the EFI report, operating in the changing circumstances facing Russian science has been tough for the researchers, especially the older ones. It noted that "The prevailing mood in the Russian research community ranges from deep pessimism to nostalgia".

The report identified several changes that had affected Russian science institutions in 1999:

- Staff losses, closure and reorganization of research institutions
- Changes in research networks
- Shifts in priorities and orientations
- Changes in forestry research priorities and spending goals

The report defined forest research organizations according to their recent publication profiles, limiting the study to those responsible for more than 10 forestry-related articles listed in the TREECD database from 1987–1999, amounting to 33 institutions, with a total of over 2000 researchers involved in forest research.

Source: Forestry research capacities in Russia, report from the European Forest Institute 1999 by Nadejda O. Bystriakova and Oleg G. Chertov. Available at www.efi.fi.

Forest research institutes in northwestern Russia:

Saint Petersburg

- Saint Petersburg Forestry Research Institute
- Saint Petersburg State Forest Academy

Petrozavodsk

- Forest Research Institute, Russian Academy of Sciences
- Petrozavodsk State University

Syktyvar

- Syktyvkar Forest Institute, Komi Republic
- Institute of Biology, Komi Scientific Centre, Syktyvkar

Arkhangelsk

- Arkhangelsk State Technical University, Forestry Faculty
- Northern Research Institute of Forestry, Arkhangelsk

Moscow

- All-Russian Research Institute of Forest Mechanisation
- Moscow State Forest University

Obtaining information on Russian research is not easy. This list should not be regarded as comprehensive, but as examples of research institutes which are open for cooperation with Nordic research organizations. We aim to complete the presentation when more information is available.

Arkhangelsk – Northern Research Institute of Forestry

The Northern Research Institute of Forestry is, beside the Forestry Faculty at Arkhangelsk State Technical University, one of the main forestry research bodies in Arkhangelsk.

Ninety-eight people are employed in the former, including 13 who have scientific doctorates, or are working towards one. The research focuses on forestry in the northern area, and the main directions are:

- Northern-taiga and pre-tundra silviculture strategies to protect raw industrial resources and the ecology.
- Systems of forest management based on analyses of the ecological and social functions of wood vegetation and its sustainability
- Forest monitoring
- Improvement of forest productivity, forest harvests, reforestation (natural and artificial) and forest amelioration
- Forest stability and forest ecological exploitation in conditions of intensive anthropogenous influence
- Conservation of biological diversity, landscape-ecological planning
- Forest certification
- Introduction of new tree species

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The SNS (the Nordic Forest Research Co-operation Committee) gives financial grants to projects involving cooperation with the so-called adjacent areas, as long as at least two Nordic countries participate. The adjacent areas are mainly the Baltic states and northwestern Russia.

Facts about the Arkhangelsk region

- The Arkhangelsk Region has one of the largest forest industries in Russia.
- The forestry sector (logging, sawing, woodworking, pulp, paper and wood chemistry activities) accounts for about 50% of the regional output (6% of Russia's total).
- Shorelines on the White, Barents and Kara Seas, which are all part of the Arctic ocean, mark the region's northern borders, while the region borders the republic of Karelia to the west, the Vologodskaya and Kirovskaya regions to the south, and the Republic of Komi and the Tuymen region to the east.
- The total area of the region is more than 400,000 km², approximately corresponding to the area of Sweden.
- The major part of the region is located in the taiga zone, but tundra and forest tundra are also common.
- Over 60% of the land is covered by forests.
- The annual harvest in 2002 was 8.9 million m³, and the annual growth is 0.6–1.1 m³ per hectare.
- Reforestation is done only on a limited scale – 32,000 hectares were subjected to natural regeneration and 9,000 hectares to sawing and planting per year.

View of the taiga-tundra border land. Photo: Mats Hannerz

Siberian larch, which has a scattered but frequent occurrence in the taiga forest of the Arkhangelsk area. Photo: Mats Hannerz

The BioNord system

Forest biodiversity indicators in the Nordic countries

Photo: Lena Gustafsson

Generating comparable statistics is the objective of many international projects based within the ambit of the EU, the UN and other bodies. In 1998 the Nordic Council of Ministers initiated a project with the aim to establish joint statistics on variations in forests in the Nordic countries. The project should provide a basis for developing common indicators of biodiversity and methods to analyse diversity-related data.

24 indicators in seven groups

The project "Biodiversity and forestry in the Nordic countries" (BioNord) used databases from the national forest inventories (NFIs) to identify 24 indicators that are relevant to forest biodiversity and trends affecting it. The NFIs provided the empirical basis for 19 of the indicators, and five were based on other data sources. Other potential indicators, for which common data are not available for all locations, were also identified. The indicators related to key themes were grouped, as follows.

1) **Forest area and land cover,** quantifying the forest area as a proportion of the total land area in each country.

2) **Resource management**, quantifying the growing timber stock and the balance between increment and felling.

3) **Forestry methods and land use**, quantifying the extent of various methods and practices used in the Nordic countries.

4) **Forest dynamics**, quantifying the extent of different types of natural disturbance that affect the forest.

5) **Forest states**, quantifying tree species composition, age distribution, dimension of living trees, tree mortality and dead wood, important substrates, and landscape patterns.

6) **Species diversity and threatened species**, enumerating the number of forest species in different groups of organisms.

7) **Conservation measures**, quantifying the amount of protected forests.

NFIs evaluated

Finland, Norway and Sweden have national forest inventories based on a grid of plots spread throug-hout the respective countries. Although the field methods vary somewhat between the countries, the majority of the indicators can be estimated with sufficient compatibility from the NFI network for comparative purposes.

Denmark, however, does not have a NFI, therefore many of the necessary data are lacking. A wealth of forest statistics have been produced in Denmark, but they cannot be directly compared to the NFI data of the other countries. Therefore, the figures for several of the criteria do not cover Denmark.

Furthermore, some of the criteria cannot be estimated from the NFI field plots, such as landscape patterns and species information. Thus, data from sources other than the NFIs must also be utilized.

Several systems in Europe

The BioNord indicators system is one of several used in Europe. They are most similar to the MCPFE indicators for sustainable forestry in Europe. Other such systems include the BEAR indicators, proposed for the "Environment of Europe process", and the general DPSIR system adopted by the EU. Although the systems have many specific indicators in common, they are not identical, but complement each other in important ways.

Future development

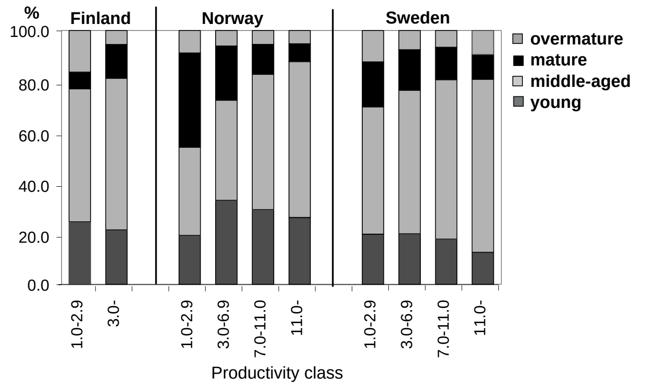
Work related to the indicators has revealed several issues that need further attention:

- data acquisition must be more closely harmonized for the classi-fication of existing parameters (such as percentage canopy cover and decay classes of dead wood), and new methods for using remote-sensing data must be developed.
- the indicators should be refined and standardized. The challenge is to keep the indicator set as small as possible while providing sufficient information on key factors for forest biodiversity.
- it must be possible to interpret the indicators with respect to forest biodiversity. The biological validation of the indicators is thus of high priority.

Source: Stokland, J.N., Eriksen, R., Tomter, S.M., Korhonen, K., Tomppo, E., Rajaniemi, S., Söderberg, U., Toet, H. & Riis-Nielsen, T. 2003. Forest biodiversity indicators in the Nordic countries. Status based on national forest inventories. TemaNord 2003:514. Nordic Council of Ministers, Copenhagen 2003.

Indicator: **Forest age**

The proportion of forest area in different ”maturity-classes” divided in productivity classes.



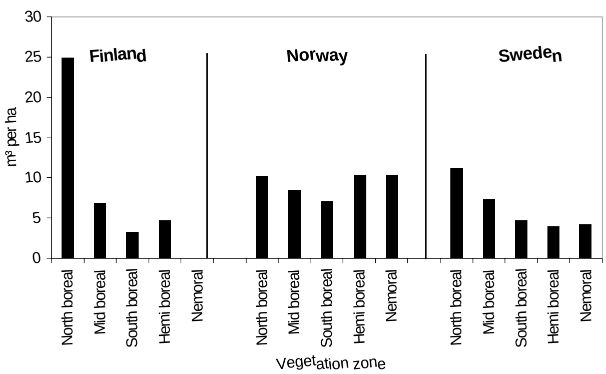
Comments: Forest age in itself is a poor indicator of biological diversity. A 100-year-old pine stand on a low productivity site should be considered biologically young. On the other hand, a 100-year-old broadleaved forest on a highly productive site should often be considered biologically mature. Therefore, development classes are used in the BioNord system: young, middle-aged, logging mature and over-mature.

The proportion of over-mature forest is around 5%, except in the low productivity areas, where the proportion is 10–15%.

Photo: Skogforsk

Indicator: **Dead wood**

Volume of dead wood in productive forests in the main vegetation zones of three of the Nordic countries.



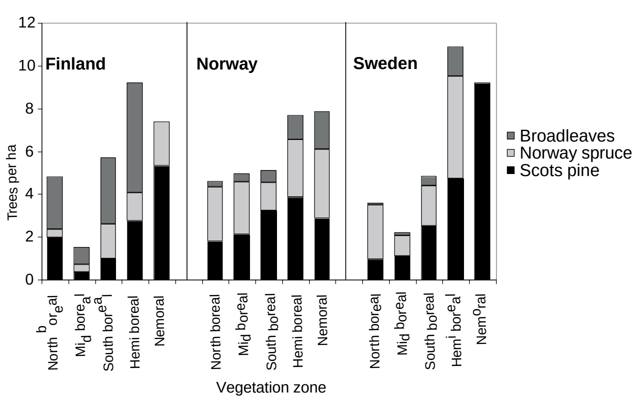
Comments: In the Nordic countries, more than 5,000 species are strongly associated with dead wood: about 20% of all forest species in the region. The most important properties of the dead wood as a habitat are: tree species, degree of decomposition, and diameter of the trunk. Many species also show preferences with respect to factors such as trunk position, local environment and tree parts.

The average volume of dead wood is 3–4 m³ per ha in low productivity forests and 7–10 m³ per ha in productive forests. Complete decomposition of dead wood takes some 50–200 years in the region. Thus, the different decay classes represent dead wood from trees that died at different times, spanning a long period.

In Finland and Sweden there is a clear trend for the volume of dead wood to increase from south to north. Finland seems to have a very large volume of dead wood in the northern boreal zone. However, this may be a random sampling effect since since dead wood has been sampled in few plots in northern Finland.

Indicator: **Tree dimensions**

Numbers of broadleaf, spruce and pine trees, >40 cm diameter, per hectare.



Comments: The size of living trees is important to forest bio-diversity since many species specialize in using trees of a particular size. Large living trees are important for some birds that need a minimum diameter for their nest holes or large branches to support big nests, while coarse and slow-growing bark is essential for specialized lichens, predatory spiders etc. Large living trees are also the only possible sources of large snags in the future. The presence of large trees is generally more of a limiting factor for forest biodiversity than the presence of small trees.

The indicator chosen to repent this characteristic is the number of large living trees per 100 ha, for each of a number of dimension classes and vegetation zones.

Photo: Areca

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● The demand for imports of forest products may vary with prices and incomes in the importing country. The economic term elasticity expresses the responsiveness of demand for goods to changes in specified factors. **James Turner** and **Joseph Buongiorno** used panel data from 64 countries to evaluate the elasticity of demand for forest products to changes in price and income. For most products, the demand for imports was less sensitive to the price than income, i.e. the higher the income, the higher the import demand.

● Scanning a log with a 3D-scanner generates a unique set of parameters which can be used to identify the same log later. This way of “fingerprinting” logs could be used to trace them, for example within the sawmill. **Sorin Chiorescu** and **Anders Grönlund** provide a case study of the finger-printing approach. In their study, the logs were first scanned over bark, and later under bark. The debarking made it more difficult to identify individual logs, but 57% of them could still be identified.

Shortcuts

Values of the Nordic forest sector

Nordic foresters are keen to promote forestry, and idealise the diverse and long-term use of forest resources. In conflict situations, they strive for mutual understanding. These were some of the conclusions drawn from a study of the values of different groups associated with forestry, based on an opinion poll of participants at the Nordic Forestry Congress in Helsinki in 2002.

Nordic forestry professionals seem to be keen to meet other citizens’ increasingly diverse expectations for the use of forests, and to participate constructively in making decisions concerning forest usage.

When it comes to the media, the foresters are usually defensive. They try to explain the needs of forestry, but don’t try to influence journalists. The key to solving problems in the future is knowledge, both practical and theoretical, according to the forestry professionals.

Source: Hellström, E., Joronen, M., Merjonen, P., Silfver, M. & Vihemäki, H. 2003. Nordic forest sector values – a cognitive mapping. TemaNord 2003: 529. Nordic Council of Ministers, Copenhagen.

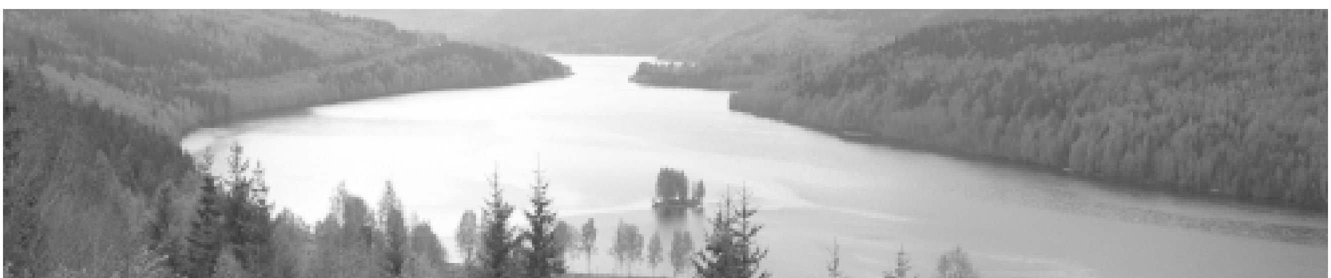
Gender and forestry

Over 900 references on gender and forestry have been listed so far in a bibliography that has been published, and continuously updated, on the internet.

The bibliography was initiated by the IUFRO Working Party 6.28.01, Gender research in forestry, and financial support was provided by grants from the EU-programme "the Utilization of the Boreal Forest" to the Vindeln Experimental Forests in Sweden.

The Forestry Library at SLU in Umeå, Sweden, is responsible for the original work and for updating the bibliography. It can be downloaded free from the SNS website **www.nordicforestresearch.org.** Researchers, students or anyone who wants to study gender issues in forestry can use it.

Source: Lyrén, L. 2004. Gender and forestry – a bibliography. Forestry Library, Faculty of Forest Sciences.



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- short
- relevant to the Journal
- interesting for the readers.

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