

from Nordic Forest Research SNS



The youth panel pointed out that climate is a topic of concern for coming generations. From left: Vilde Gjerde Lied (Natur og Ungdom), Eivind Handegard (student NMBU), Tora Voll Dombu (Norges Bygdeungdomslag) and Malin von Essen, one of the two moderators. Photo Mats Hannerz.

Climate mitigation in focus at Nordic Ministers' meeting

The Nordic forests play an important role in mitigating climate change, and the role will increase with improved forest growth. The benefit of forests sequestering carbon is two-fold: carbon can be stored in the forest and/or extracted as wood to replace fossil-based materials and reduce emissions of new carbon to the atmospheric carbon cycle. However, more intensive forest growth must be balanced against other values in the forest.

These were take-home messages from the seminar *Climate, forest and biodiversity* in Ålesund, Norway, on June 27 2017. The seminar was held in conjunction with the Nordic Council of Ministers' summer meeting, which brought together some 240 people from governmental administration

and forest sector organisations in all Nordic countries. The visitors could choose between seminars on antibiotic resistance, agriculture and climate, and the SNS-organised seminar on forest, climate and biodiversity.

The forest seminar was built around three closely related topics. **Tomas Lundmark** from the Swedish University of Agricultural Sciences explained how the Nordic forests contribute to climate change mitigation. **Ivar Gjerde** from the Norwegian Institute of Bioeconomy described the status of biodiversity in Norway, Finland and Sweden. Finally, **Maria Ojala**, from Örebro University, and **Sverker Johansson**, journalist, discussed young people's perspectives and how communication from the forest sector has an impact on the civil society with a special focus on young people.

Climate actions today affect the future

Throughout the seminar, a youth panel from Norway gave their viewpoints on each of the lectures and exercises. **Vilde Gjerde Lied** from Natur og Ungdom, **Tora Voll Dombu** from Norges Bygdeungdomslag and **Eivind Handegard**, a forestry student at the Norwegian University of Life Sciences explained how the younger generation engages with forests and forestry.

It was evident that young people have a strong belief in what forests can deliver, but also serious concerns about preserving nature for its own sake and for social needs. For the audience, it was also apparent that decisions and actions today affect the future of the young and future generations.



Climate seminar, cont.

Manage AND preserve the forests

The potential conflict between managed and preserved forests was present throughout all sessions. At the end of the seminar, participants were asked to place themselves along a line, showing if they were inclined to use the forest more than today, or preserve more of it. The potential of the forest as a tool in combating climate change probably explained why most placed themselves more on the “use” side. However, all participants agreed that it was important to preserve forests as well.

6 tonnes of carbon dioxide

One of the exercises that took place during the seminar involved calculating the carbon impact of travelling to the event. All of the 35 or so participants were asked to state if they had travelled by domestic or international airplane, train, car or by other means. The total impact amounted roughly to emissions of 6 tonnes of fossil carbon dioxide, which corresponds approximately to the annual impact per capita in Europe.

Can the impact be compensated for by increased forest growth? The answer was “Yes”, according to Tomas Lundmark, who showed that the 6 tonnes corresponds to the climate benefit of using 12 cubic

metres of wood through substitution of fossil products. Twelve cubic metres is also equal to the increased growth we can expect from a one-time nitrogen fertilisation of one hectare of forest in Sweden. If the extra wood is left in the forest as carbon storage, 6 tonnes corresponds to 8 cubic metres.

This illustrative example showed that measures to increase forest growth are a way of mitigating climate change.

All presentations can be downloaded from SNS' website www.nordicforestresearch.org



Intensive discussions about climate and biodiversity at the seminar. Photo Mats Hannerz.

Ålesund 2017: Most species are rare

The red-list of endangered species is used as a guideline for conservation efforts and is also a tool in the environmental debate. Ivar Gjerde, the Norwegian Institute of Bioeconomy Research NIBIO, explained that the length of the list increases the more we learn.

Most species are rare. Among the species listed as threatened in Norway, 64% are observed in less than 10 sites. More intensive research and surveying will detect more species, a phenomenon shown in many studies.

A species can be added to the red list mainly by two reasons: it can be naturally rare or it may have a negative development trend. A study by a PhD-student at NMBU has shown that species on the edges of their distribution range are more likely to be added to the national

red lists. Norway has many species with a western distribution on its list, and Sweden many with more southerly population centres. Among the species on the Norwegian list, almost half have a viable population outside the country.

So, if the red list is not a direct measure of biodiversity status, how can it help us in conservation? Ivar Gjerde stressed that it is valuable for identifying high quality environments.

Is biodiversity going up or down?

We lack true data on population changes for most species. Their rise or fall is instead based on qualified guesses and expert evaluations. Ivar Gjerde would like to see robust and objective methods to monitor ecological structures and biodiversity. Such monitoring in Norway is undertaken in the project

Miljøregistrering i skog, which has surveyed over 190,000 plots since it started in 2001. Of these, almost half are identified as woodland key biotopes.

Ivar Gjerde also compared the development of valuable structures in the Nordic forest, an indicator of biodiversity status. Over the last 15-20 years, the area of broadleaved forests has increased by 7-10% in Sweden and Finland, and 27% in Norway. The amount of deadwood is 6-11 m³ per hectare and has increased in Norway and Sweden. The same applies to old productive forest (>140 years old), which has increased by 7-9% in Sweden and Norway, but decreased, on average, in Finland. The positive trends for valuable structures may increase populations of rare wood-inhabiting organisms. This will make such species easier to detect, and also affect the red list.

Ålesund 2017: Young people think differently

Many young people have a pessimistic view of climate and the global future. They do not think that they have the power to influence what happens, but still they have hope.

Maria Ojala from Örebro University has studied the attitudes and values of young people to climate and environmental issues. She argued for much better communication that involves the younger generation's way of thinking.

Currently, climate is an abstract issue for people in the developed parts

of the world. We are still not affected at a personal level. Therefore, climate issues and the forests' role need to be concretised. Maria Ojala pointed out the importance of helping young people experience nature, but also of finding communication tools such as computer games, art, literature and visualisation to engage the young.

She also stressed the need to involve young people in the decision processes.



Maria Ojala. Photo Mats Hannerz.

Ålesund 2017: Communication - the forest sector has a lesson to learn

The forest sector has long had a low profile in communicating its messages to the public.

When they communicate, they often do it inappropriately, according to Sverker Johansson, journalist and owner of Bitzer Production. He has, in particular, studied a number of campaigns from

the forest sector in Sweden, and finds that messages on soft values and climate benefit are often toned down. Social media are not at all used the way they could be. Environmental NGOs are far more successful in communicating with the public.



Sverker Johansson. Photo Mats Hannerz.

Ålesund 2017: Climate benefit has doubled in 50 years

In the short run, climate wins on preserving the forest as a carbon store. With no wood harvest, more carbon will be fixed in the forest as long as the forest exhibits positive net growth.

However, when trees age, they start to decline, die and finally release carbon dioxide. An old forest is therefore in balance between uptake and release of carbon dioxide. Tomas Lundmark from the Swedish University of Agricultural Sciences presented figures demonstrating that such a forest does not further benefit

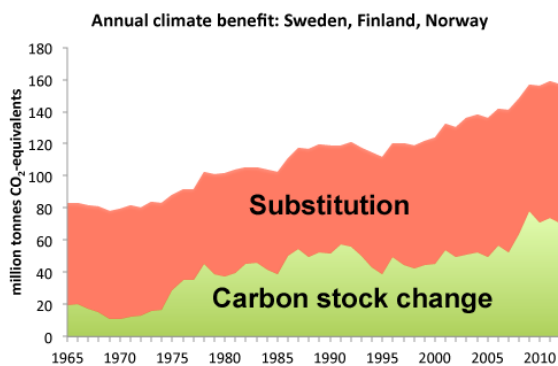
climate, although it can store large amounts of carbon.

Storage and substitution

A managed forest benefits climate in two ways. First, it removes carbon from the atmosphere as long as the growing stock increases, which is the situation in all Nordic countries. Second, wood that is harvested and used replaces fossil or other energy-demanding products such as oil, coal, steel and concrete. This is the substitution effect, and it reduces

the addition of new fossil carbon to the atmospheric carbon cycle.

Tomas Lundmark showed what happens over time if a forested landscape is managed or left for preservation. During the early decades, the non-managed forests will be slightly better for the climate. After about 80 years, the non-managed forest loses productivity and the managed alternative will become increasingly superior. The managed forest will have a sustainable growth, and the harvested wood can be used for substitution.



The annual climate benefit from the forests of Sweden, Finland and Norway 1965 until 2012. The benefit is divided in annual change of carbon stock in the forest, and substitution, when wood is harvested and substituted for fossil products and energy-demanding steel and concrete. The data are based on the presentation by Tomas Lundmark.

Double benefit

The forested countries of Sweden, Finland and Norway today contribute an annual climate benefit corresponding to 173 million tonnes of CO₂. This is in the same order of magnitude as the net emissions of carbon dioxide from all sectors except land use in these countries.

The climate benefit has also doubled over the last 50 years. This is due to increased net growth in the forest, allowing both more carbon to be stored and to be used as substitution.

Shortcuts from Nordic forest research

Norway

Celebrating 100 years

The Norwegian forest research started off in 1916-1917 and its century birthday is celebrated in many ways. Norwegian Institute of Bioeconomy Research, NIBIO, organises a full day jubilee seminar in Ås, October 19th, 2017. The seminar is open to the public.

Read more: www.nibio.no

Finland

New record for industrial roundwood felling ...

The positive trend in the forest industry in Finland resulted in a new felling record in 2016. A total of 61.8 million cubic metres of roundwood was harvested. This was 17 percent higher than the average for the previous 10 years.

Read more: www.luke.fi

... and for wood fuel

Heating and power plants consumed a total of 19.3 million solid cubic metres of solid fuelwoods in 2016. This was an all-time record in Finland. Wood fuels accounted for 26 percent of the total energy consumption in Finland 2016. The generated energy from wood fuels was 96 TWh.

Read more: www.luke.fi

Denmark

Contributes to global forest restoration

University of Copenhagen supports "The Bonn Challenge", which has restored more than 150 million hectares of degenerated forests all over the globe. Researchers from the Department of Geoscience and Nature Management have provided guidelines for how the restoration work can be carried out.

Read more: www.ign.ku.dk and www.bonnchallenge.org

Sweden

Route planning tool twice awarded

Skogforsk with partners has been awarded prizes for the route planning tool Calibrated Route Finder, in Swedish *Krönt Vägval*. The program finds the best route for logging transport from forest to industry, taking economic, environmental and social concern. First, it was awarded the Daniel H Wagner Prize for Excellence in Operations Research Practice. The prize was received at a ceremony in Las Vegas. Second, it was awarded the Schweighofer Innovation prize 2017.

Read more: Skogforsk, www.skogforsk.se



Birch genome is mapped. Photo Mats Hannerz.

Estonia

Birch genome sequenced

Estonian scientists have been part of an international research team that has published the genome of silver birch (*Betula pendula*). The work was led from University of Helsinki, Finland. Eighty individual trees were sampled through Finland, Germany, Norway, Ireland and Siberia. The wide range of specimens allowed the team to identify several key mutations important for understanding the environmental adaptation of birch.

Read more: www.emu.ee. The study was published in *Nature Genetics* 2017.

Finland

Damage risks usually higher in even-aged forests

A Finnish study has compared the damage risks in uneven-aged and even-aged managed forests. The highest risk in Scots pine was caused by moose (even-aged management) and harvesting damage (uneven-aged management). In Norway spruce, root rot caused the highest risk in both management types. Even-aged forestry involves more practices which favour various types of damage.

Read more: *Silva Fennica* vol. 51 (3), id 1741.

Sweden

More trees but less forest floor vegetation in Swedish forests

Sweden's forests are becoming more dense and timber rich, according to 2017's official statistics from the Swedish National Forest Inventory. The standing volume on productive forest land has increased by 54% since the early 1950s, from 2000 million to 3100 million cubic metres. The average volume per hectare amounts to 138 cubic metres. It is not only the "new" forest that is denser, but also the old forest as a result of harvest of sparse and lowproductive stands.

At the same time, forest floor vegetation coverage has declined by ca. 10% since 1999. Bilberry and reindeer lichen seem to have been disfavoured by the increased competition from the overstory trees.

Read more: Skogsdata 2017, statistics from the Swedish National Forest Inventory, Swedish University of Agricultural Sciences. www.slu.se

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