

ShortCuts

FROM SKOGFORSK. NO 2 | 2016 | RESEARCH FOR TOMORROW'S FORESTRY

A man with glasses and a beard, wearing a blue and white plaid shirt under a dark jacket, is looking upwards in a forest. The background is filled with tall trees and green foliage, with sunlight filtering through the leaves.

An eye for

SMARTER TREE RETENTION

ON NEW CHAIRS | EN ROUTE TO MORE EFFICIENT TRANSPORTS | MORE SERVICES =
MORE BUSINESS: 5 STRATEGIES FOR GOOD BUSINESS | WINDSMART TRUCKS ON THE WAY

FUEL CONSUMPTION: DOWNWARD TREND AT LAST? | FUEL VALUES WITH WECALC

NEW DOCTOR AT SKOGFORSK | EFFICIENT CONSERVATION



MARIE LARSSON-STERN TO CHAIR SWEDISH FOREST AGENCY

Skogforsk's research director Marie Larsson-Stern was appointed chair of the Swedish Forest Agency when the Swedish Government presented the new board, which will lead the agency for the next three years.

■ Marie Larsson-Stern is research director of the Forest Production research area at Skogforsk, which includes the programmes Tree Breeding North, Tree Breeding South, and Silviculture and Environment. Since 1 May, she has also been chair of the board of the Swedish Forest Agency.

"Leading the board is an honour, and is an inspiring position. There's a diversity of expertise in the new board, which will be valuable in the work to support the development of the agency's tasks," says Marie Larsson-Stern.

"I'm really pleased she's accepted the role of leading the work of the board," comments Minister for Rural Affairs, Sven-Erik Bucht. "Her broad background in production and environmental issues relating to forestry, and her broad contact network in the sector, makes her highly suitable for the task."

Other members of the board of the Swedish Forest Agency:

Katarina Eckerberg
Anna Furness
Lena Heuts
Mikael Karlsson
Tomas Käberger
Pär Lärkeryd
Håkan Wirtén
Herman Sundqvist
(Director-General)

GÖRAN ÖRLANDER NEW CHAIRMAN AT SKOGFORSK

Göran Örlander has been appointed new chairman of Skogforsk.

■ "The forest is Sweden's most important resource in the transition to a bioeconomy. Skogforsk will be playing a key role in leading the move towards high-production forestry with minimum environmental impact," says Göran Örlander.

Göran Örlander succeeds Herman Sundqvist, who earlier this year left to take up the position of Director-General of the Swedish Forest Agency. During

the interim period leading up to the Annual General Meeting, Göran Örlander led the work of the board in his role as vice-chairman.

Göran Örlander is a sustainable forestry strategist at Södra skogsägarna, a forest scientist, and has a PhD in forestry. His career has included positions at the Swedish University of Agricultural Sciences, Linnaeus University and the Swedish Forest Agency.

At the Skogforsk AGM, he emphasised that Skogforsk can



make a key contribution in the societal debate by demonstrating the climate advantages afforded by sustainable forestry.

"The new board is already working on Skogforsk's new research and innovation strategy for the next four-year period. The new strategy will focus on sustainable forestry," comments Skogforsk's CEO, Charlotte Bengtsson.

The Skogforsk board

Göran Örlander, Södra Skogsägarna | Uno Brinnen, BillerudKorsnäs | Gabriel Danielsson, Linköpings skogstjänst | Martin Holmberg, Stora Enso Skog | Sture Karlsson, Mellanskog | Lotta Möller, Skogssällskapet | Tommy Nilsson, Sveaskog | Annika Nordin, SLU | Maria Nordström, Skogforsk | Erik Normark, Holmen Skog | Karin Perhans, Formas | Mats Sandgren, SCA Skog | Olof Söderström, Norrskog



Longer and heavier vehicles reduce fuel consumption, emissions, and road wear, without compromising road safety. They will soon be introduced in Sweden.

■ Skogforsk is therefore inviting guests to three regional seminars – in Växjö, Falun and Umeå – where we will be summarising

the experiences and research findings of recent years. We are also hoping for rewarding discussions about how the country's future high-capacity transports will affect society.

Since 2007 Skogforsk has been working with public agencies, manufacturers and industry to investigate the effects of using longer and heavier trucks. The

results are very promising and, today, nearly 50 vehicles in Sweden are the subject of trials and studies.

During 2016, the Swedish Government is expected to propose an increase in maximum gross weight to 74 tonnes.

READ MORE: skogforsk.se

GOLDEN LOGGER

FRAMGÅNGSRIKA SPECIALISTER GYNNAR MÅNGFALDEN

Det har varit ett gyllene år för SkogsElmia i samarbete med Skogforsk och Swedbank. De som har vunnit i tävlingen är de som har varit framgångsrika i att erbjuda sina kunder ett stort utbud av tjänster. Detta gör att de kan erbjuda sina kunder ett stort utbud av tjänster. Detta gör att de kan erbjuda sina kunder ett stort utbud av tjänster.

OCH SATSAR PÅ NY TEKNIK

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SkogsElmia

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ENTREPRENÖR

GOLDEN LOGGER

RISK SPRIDAREN

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MORE SERVICES MORE BUSINESS

Does offering a broad range of services improve business for forest contractors? The answer is yes, at least if we look at the companies nominated for the final in the last two Golden Logger competitions.

■ 'The Golden Logger' prize is awarded every other year by SkogsElmia in collaboration with Skogforsk and Swedbank, to forest entrepreneurs who distinguish themselves as role models in the sector. According to the criteria, the prizewinner has to be someone who shows they can be profitable while still being receptive to the needs of the customers.

"Eight of the nine companies

nominated to the final of Golden Logger on the past two occasions can offer multiple services," observes Birger Eriksson of Skogforsk, whose work focuses on contractor development.

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090-203 33 66

Read more about the finalists in VISION. All editions are available at skogforsk.se

GOLDEN LOGGER

"AFFÄRER ÄR MIN DRIVKRAFT"

Det har varit ett gyllene år för SkogsElmia i samarbete med Skogforsk och Swedbank. De som har vunnit i tävlingen är de som har varit framgångsrika i att erbjuda sina kunder ett stort utbud av tjänster. Detta gör att de kan erbjuda sina kunder ett stort utbud av tjänster.

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READ MORE: You can download the folder 'Service production in Golden Logger companies' from skogforsk.se.

VISION

Den inre effektiviteten i företaget är avgörande. Läs om hur de gör det i denna artikel.

VI LETAR ALLTID EFTER GULDKORN

Det har varit ett gyllene år för SkogsElmia i samarbete med Skogforsk och Swedbank. De som har vunnit i tävlingen är de som har varit framgångsrika i att erbjuda sina kunder ett stort utbud av tjänster. Detta gör att de kan erbjuda sina kunder ett stort utbud av tjänster.

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5

strategies for good business

Broadened services
Some companies offer their customers service packages for work on the same site. For example, logging planning followed by undergrowth clearance and felling.

More services
The majority of the companies that offer additional services to logging offer more than two 'extra' services. From two of the companies, customers can purchase everything from construction of simple forest roads to logging and silviculture activities.

Sales within the sector
Two of the companies also sell services and products to other logging companies, such as trailer transport, machine service and hydraulic pipes.

Sales to other sectors
Trailer transport, machine service and hydraulic pipes can also be sold to other sectors.

Product trials
Arranging trials of equipment and machines.

WINDSMART TRUCKS ARE ON THE WAY

Skogforsk's windsmart trucks are now hitting the road to show how much fuel they can save.

■ Three test vehicles will be driven from the forest to different mills. The trucks are already being driven with a heavier load (gross weight 74 tonnes), and are now fitted with aerodynamic features that reduce drag.

"In the wind tunnel, we've

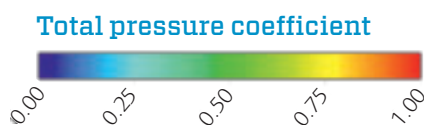
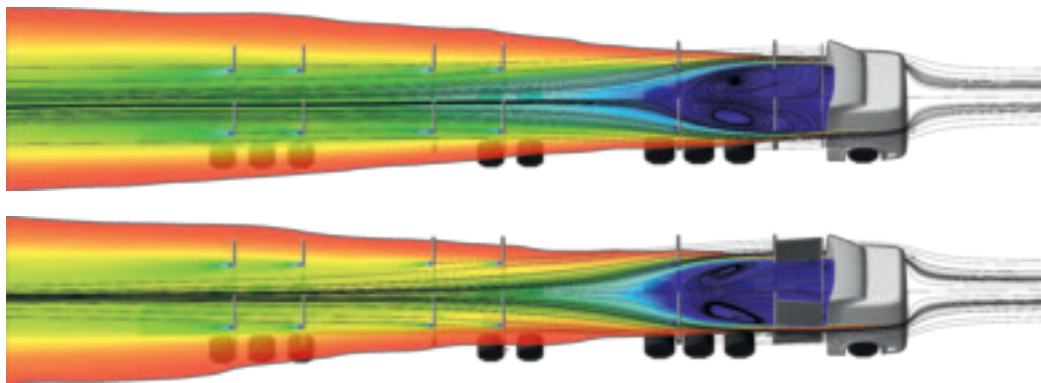
showed that an aerodynamic design of timber trucks reduces diesel consumption," explains Skogforsk's vehicle expert Claes Löfroth. "And the vehicles we'll be testing on the roads can reduce fuel consumption by no less than 10-15 percent!"



Claes Löfroth is now testing his windsmart trucks on the roads.

5 WIND DEFLECTORS

1. Large wind deflectors designed for timber truck cabs.
2. Covered space between the front wall and the first pair of stakes.
3. Collapsible banks and stakes to reduce drag when the vehicle is driven unloaded.
4. 'Boat tail' for chip trucks.
5. Aerodynamic undercarriage cover.



The upper truck in the illustration is an 'ordinary' 74-tonne vehicle, while the lower one has an aerodynamic shield between the front wall and the first pair of stakes. The area of low pressure behind the cab and the truck is reduced on the vehicle

with the shield, because the air flow creates less turbulence. Even in the first tests, the shield showed a 10 percent reduction in drag, which would reduce fuel consumption by approximately 3 percent.



Fröjds Åkeri in Kisa owns one of the test trucks that was designed with a bigger cab deflector on the basis of the tests in the wind tunnel. It will also be fitted with a shield between the front wall and the first pair of stakes.



Downward trend at last?

FUEL CONSUMPTION

Skogforsk has been monitoring fuel consumption of timber trucks over a number of years, and results show that fuel consumption per transported tonne has remained virtually unchanged for over 12 years. It is now time for the next study – will the results show a trend towards reduced fuel consumption this year?

■ The indications are that the figures may improve. On 1 June 2015, the maximum permitted gross weight of trucks with a connected trailer was increased from 60 to 64 tonnes. Increased gross weight gives lower fuel consumption per transported quantity.

A questionnaire is currently being sent to hauliers working with forest transports. The aim is to monitor fuel consumption over time, and to identify any tendencies regarding new generations of vehicles and engines.

Similar surveys were carried out in collaboration with the Swedish Association of Road Transport Companies in 2008 and 2013.

READ MORE

Read more in VISION no. 4/2014 about the tough challenge to reduce fuel consumption. This is available at skogforsk.se.

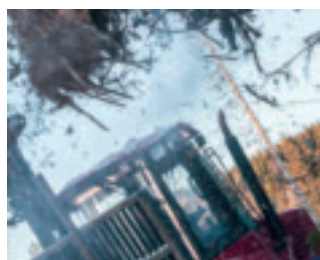
PHOTO: SVERKER JOHANSSON/BITZER

Look up

FUEL VALUES WITH WECALC

WeCalc is used to calculate prices for various types of forest fuel. The tool is now available at skogforsk.se – improved and adapted for use with mobile devices.

■ WeCalc is used to calculate conversion factors and make calculations for various types of forest fuel. Comparisons can be made between, for example, different assortments, treatment and storage, and volumes, weights and energy content can be calculated. The tool also has a



price function that enables calculation of the value of a fuel delivery.

READ MORE
Read more at www.slu.se.

NEW DOCTOR AT SKOGFORSK

Skogforsk researcher Rebecka McCarthy has been awarded a PhD, after completing her thesis on establishment and early management of poplar and hybrid aspen.

■ In her studies, Rebecka examined how hybrid aspen and poplar can be established on forest land, and how second generations can become established through root and stump shoots in young forest. Hybrid aspen and poplar are fast-growing tree species, and they



PHOTO: MALIN SÅAF SKOGFORSK

Rebecka McCarthy, PhD studies on *Populus* species.

can increase the proportion of renewable energy and the proportion of deciduous trees in forests.

Tree retention *that works*

But retention
during final felling
does not solve
everything

Tree retention is now routine practice during final felling, but what do we know about the actual benefit? Quite a lot in fact, as Skogforsk and SLU have compiled the results from completed studies into syntheses.

Text MATS HANNERZ | Foto SVERKER JOHANSSON/bitzer | Illustration ROSE-MARIE RYTTER

Researchers on the Smart Tree Retention programme have compiled syntheses about what we know about various tree retention measures.

The syntheses attracted a lot of attention during the spring, and headlines such as “Now we know – tree retention works!” were prominent in the media and social forums. But the principal authors – Skogforsk’s Jan Weslien and Lena Gustafsson, SLU – are still cautious. The compilation does not suggest that tree retention could replace the need for protecting forest.

“It’s pleasing that so many studies show positive results, but we mustn’t think that tree retention on the clearcut solves all the problems facing forest animals and plants,” says Jan Weslien.

120 scientific studies

In the report, the researchers compiled 120 scientific studies showing the actual benefit of leaving trees on the clearcut. Each study is described with a brief summary, so that readers can form their own impressions. The studies were then grouped into syntheses and recommendations made for tree retention measures, such as leaving trees in riparian zones, and retaining high stumps or aspen on the clearcut.

Jan and Lena have been working on tree retention issues for many years, and were also involved in a number of the studies themselves. Nevertheless, they were surprised at the picture that has emerged.

“Many studies show the value of an open landscape with many substrates,” says Lena Gustafsson.

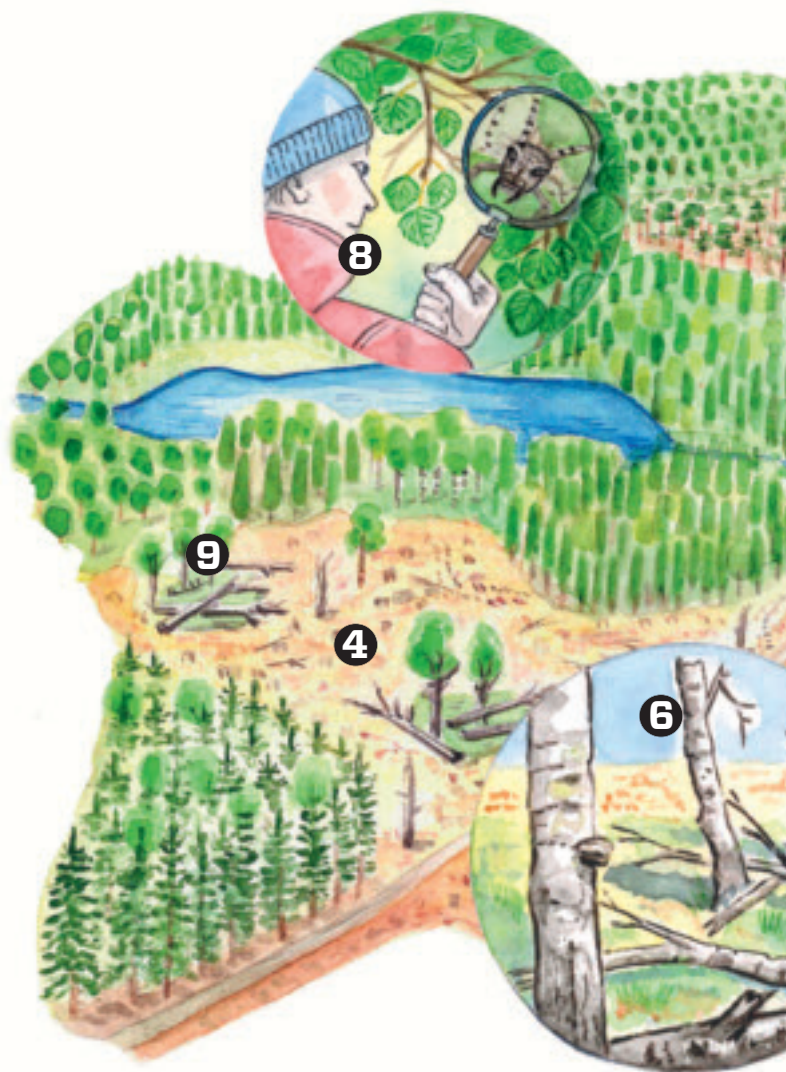
Substrate important

In many cases, red-listed species have adapted well to the clearcut, providing there is suitable dead wood or tree stems. Fungi such as *Antrodia serialis* and lichens such as common witch’s hair (*Alectoria sarmentosa*), Boreal oatmoss lichen (*Evernia mesomorpha*) and horsehair lichen (*Bryoria nadvornikiana*) are regarded as specialists that depend on old forest. They have been shown to adapt well to retention clearcuts, and red-listed species have sometimes been able to colonise retention trees and felled tree stems.

“For some wood-living fungi and lichens, access to the substrate seems to be more important than the forest environment in itself. We’ve seen that, for example, the red-listed lungwort (*Lobaria pulmonaria*) thrives on the north sides of aspen trees left on the clearcut,” says Lena Gustafsson.

Jan Weslien has also been struck by the importance of high stumps on the clearcut for threatened beetle species like *Peltis grossa*. High stumps comprise a very small proportion of all dead wood in a forest landscape, but they still fulfil an important function.

“By leaving high stumps, we are recreating the sunlit standing wood that many species, not least insects, depend upon. ►





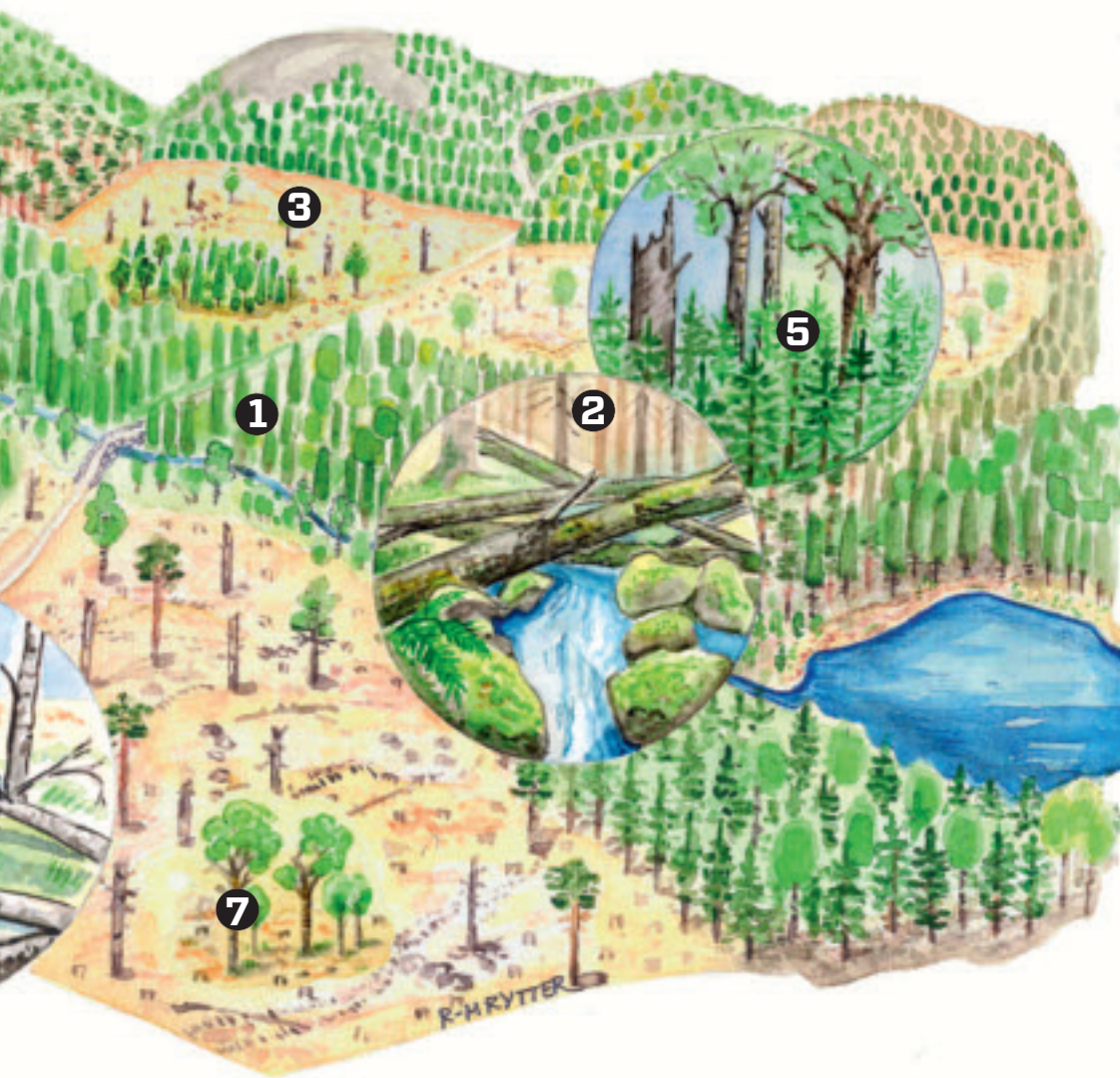
“ We could make better prioritisations if laws and standards considered the overall measures on a property instead of individual logging sites.

Jan Weslien



“ Studies have shown that much of the dead wood is damaged by scarification or during forest fuel harvest.

Lena Gustafsson



1 | There are often more species in a riparian zone than on the adjoining clearcut.

2 | The diversity of mosses is particularly high where there are many fallen trees and stones. Many species in such environments are particularly sensitive to felling.

3 | Fewer trees fall in large retention patches than in small. Survival of certain red-listed mosses and lichens is greater in shaded retention patches, for example, on the north side of mature forest. Proximity to forest also increases the possibilities for forest species to spread.

4 | Tree retention promotes species linked to dead and older living trees in open environments. These types of environments are found, for example, in small retention patches containing both dead and living trees.

5:1 | Many beetles thrive in open, standing high stumps in growing forest.

5:2 | Many mosses and lichens found on aspen and oak benefit from light and open forests.

5:3 | Some beetles, mosses and lichens prefer shaded environments.

6 | Some rare beetles that live in dead trees on the clearcut are most common when there are many trees of the species they depend on.

7 | Both large and small aspens are important environments for mosses. More rare mosses and lichens survive on the north sides of stems than on the south. Living aspen trees that are retained often die during the clearcut phase and are colonised by rare beetles and fungi.

8 | Access to extensive information about the natural value of a stand increases possibilities for cost-effective planning of tree retention.

9 | A number of studies show that many forest-living species cope better on the clearcut if trees are retained than if the clearcut is completely bare.

In natural landscapes, this type of wood is created after storms and fires, but this is less common today,” he says.

Both professors emphasise that tree retention is not sufficient for all species, particular if too few trees are left. Sensitive species like liverworts (*Marchantiophyta*) are dependent on a relatively homogeneous and damp environment, and there are birds that seem to need large, unbroken stretches of forest.

“Careful tree retention must involve both protected areas and tree retention in the productive forest,” says Lena Gustafsson.

Look beyond the clearcut

The professors agree that current legislation and certification regulations were brought in on the basis of more or less educated guesses about the effects of tree retention.

“Today, we can provide more informed recommendations, even though we still have a lot to learn. One recommendation is to consider the local environment in decisions on tree retention. In a core area for aspen, it can be more important to retain many aspens on the clearcut rather than trees of many different species,” says Jan.

They both emphasise that smart tree retention measures cannot just focus on a single clearcut. The appearance of the entire landscape is important for whether species will survive.

“It is, of course, a challenge for those who develop the regu-



Lena Gustafsson, SLU och Jan Weslien, Skogforsk

latory framework, but I believe we could make better prioritisations if laws and standards considered the overall measures on a property instead of individual logging sites,” says Jan Weslien.

More long-term studies

Other recommendations arising from the syntheses are to situate retention patches close to old forest, preferably with shaded north-westerly aspects, to save more high stumps of deciduous trees, and to leave aspens of all sizes, not just large trees.

“Then, of course, there is the self-evident instruction about not damaging the retained trees. Studies have shown that much of the dead wood is damaged by scarification or during forest fuel harvest. Machine operators must be given better instructions, and the instructions must also be given to whoever manages the young forest and thinning forest,” says Lena Gustafsson.

Is the research on tree reten-

tion now completed? The two professors are emphatic in their response.

“Oh no. The research has only scratched the surface so far. Many of the studies just give a snapshot of the situation after final felling. In our longer time studies of high stumps, we could see for example how the environment changes and how the species were colonising the area several years later. We need considerably more long-term studies. Can retention patches, for example, serve as a lifeboat for forest species, and will the species there spread to the new forest?” ponders Jan Weslien.

Both also call for more research into different tree species; for example, there are few studies focusing on Scots pine, even though the species is so common in Sweden.

“I would also like to see more studies of how the clearcut affects the ecosystem functions. What happens to the mycorrhiza

fungi? Do they recover after the clearcut phase? And how do clearcuts affect human experiences? Clearcuts could be made much more accessible for recreation,” says Lena Gustafsson.

Threshold values difficult

One of the most common questions posed to researchers is how much retention is needed, and the answer is “it depends”. Some researchers have tried to calculate threshold values for dead wood in the forest, or how many trees should be left on the clearcut, but the answers depend on the species and the nature of the landscape.

But one thing the researchers are convinced about is that more retention increases diversity. But what would happen if we extrapolated this to 100 percent retention, i.e. shut down forestry?

“I think that would give us a poorer landscape without variation; there are still many species that need the open, sunlit clearcuts, with many dead and living trees, in the productive forest,” says Lena Gustafsson.

All syntheses are collected in the report Tree retention in final felling – a synthesis of research from the Nordic region and the Baltic States.

READ MORE:

www.slu.se/smarthansyn-synteser



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