

Skog Alnarp



Southern Swedish forest research centre



A growing wall of theses

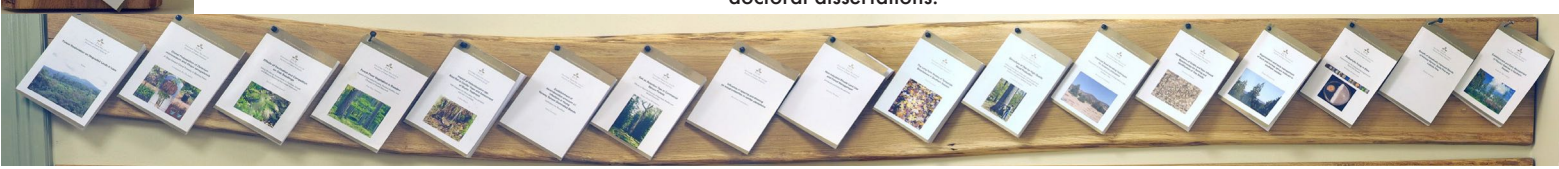
In 2019, Linda Petersson (photo) and Lisa Petersson nailed their doctoral theses. Well over 60 people have defended dissertations at Southern Swedish forest research centre. Some of them are presented on page 4.

In Sweden, nailing the dissertation is a traditional way to publish it for review a few weeks before the defense.

Annual report **2019**



At the top left of the page are the SSFRC's first theses. Just above to the right is Lisa Petersson's dissertation from December 2019. In between are three decades of doctoral dissertations.



Taming the time

Time flies. I became head of department in August 2018 but it feels as if some 5 years have passed. Such an impression signals that the inner pace of mind is not catching up with the intensity of outer happenings.

Several colleagues and friends have been gradually retiring over last few years. Eric Agestam, Ola Sallnäs, Pelle Gemmel and Per Magnus Ekö were the co-creators of our department's research and education.

Most importantly, they formed the extraordinary atmosphere, where good relationships weigh higher

than personal ambitions. With gratitude and respect, we shall build further on the foundation laid down by Eric, Ola, Pelle, PM and their comrades!

The new generation comes in new times where the audit society counts publications and the raised kronor, constantly pushing for efficiency, excellence, throughputs and the like. Predictably, many of us struggle with time pressures every day.

I keep admiring every colleague at our department who, with dedication and a positive mindset, successfully navigate among all those modern requirements.

I wish myself and all colle-

agues not to get bogged down in daily deadlines, instead having an occasional break and asking some big questions, such as: What is the bigger meaning with my job? Am I doing the right things or just doing things right? How is it going with my neighbor in the next office?



Prefect
Vilis Brukas

Contacts

Prefect Vilis Brukas
Vice prefekt/dir of studies
Giulia Attocchi

Education

Director of studies
Matts Lindbladh / Emma Holmström (institutionen)
Jörg Brunet (Euroforester)
Euroforester coordinators
Desiree Mattsson
Andis Zvirgzdins
PhD education
Annika Felton

Research

Ecology /nature conservation

Jörg Brunet
Jaime Uria Diez
Igor Drobyshev
Adam Felton
Annika Felton
Per-Ola Hedwall
Matts Lindbladh
Mats Niklasson

Silviculture

Eric Agestam
Jorge Aldea
Giulia Attocchi
Ignacio Barbeito
Henrik Böhlenius
Per-Magnus Ekö
Emma Holmström
Magnus Löf
Urban Nilsson
Jens Peter Skovsgaard
Narayanan Subramainen
Tropical forest/seed science
Per-Christer Odén

Policy / Planning

Vilis Brukas
Carl Salk
Renats Trubins
Pathology
Michelle Cleary
Carmen Romeralo
Jonas Rönnerberg
Patrick Sherwood
Johanna Witzell
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Media/outreach

Samverkanslektor:
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Katarina Ekegren

In touch with society



Excursions have always been an important tool for communicating the institution's research results. For over three decades there have been many educational field trips, including last year's outing "Broadleaf trees and effective nature conservation for a better landscape." Activities planned for 2020 include an excursion to Tönnersjöheden 16-17 June about forests and climate.

Our dedication to external cooperation has a dual purpose. On one hand, we communicate our research results, while on the other we receive input that guides our choices of focal areas. During 2019 we took part in several

projects, including regional forest programs. Our close collaboration with Partnership Alnarp is an important part of our outward-facing work.

Henrik Böhlenius



Our Skog Alnarp newsletter has picked up more readers. In addition to subscribers, articles from the newsletter are picked up by other media, including Skogsverige, the leading news source for the Swedish forest sector with over a million annual visitors.

All previous newsletters can be found at skogalnarp.slu.se.

Anyone who would like a free subscription should email sydsvensk-skogsvetenskap@slu.se.

New appointments in 2019:

Annika Felton, director of doctoral Studies.
Johanna Witzell, coordinator of master theses.
Giulia Attocchi, vice prefekt
Emma Holmström, vice prefekt head of undergraduate Studies.

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Education

Education is growing with two new programs

In 2019 SLU began the 'doubling project' to increase its numbers of applicants and enrolled students. During the summer and autumn, we worked intensively on proposals for several new bachelor's and master's programs.

We have two new programs under development in Alnarp as part of an effort to strengthen our offerings. This means that teaching is becoming more central to our department, with more employees involved as course leaders, teachers and supervisors. But we aren't losing focus on our existing programs.

Our Euroforester master's program is Europe's most

international forest education program. Since its origins 20 years ago, students from over 40 countries have taken Euroforester courses.

Forestry master's students from Umeå visit us every year as part of their field trip around Sweden to focus on southern Swedish forestry. During the spring term we give a course on silviculture as part of Alnarp's agricultural education.

For Euroforesters, there will be some changes in how scholarships are allocated to international students. While IKEA was for many years the financial backbone of Euroforester, their support has been



Jens Peter Skovsgaard with Euroforester-students during a visit to Denmark 2019.

reduced. A new three-year agreement with Skogssällskapet and SCA funds students from the Baltic region.

We can now also support some Swedish students

through a grant from the Seydlitz MP Company Foundation.

Jörg Brunet

Joint program with Linnaeus University

Together with Linnaeus University, we will begin a new distance master's program called "Multiple-use Forestry". The program is unique in being a joint degree program between the two universities.

Work on the program has been ongoing for more than a

year. Because many told us it was impossible and that other universities had tried and failed to institute joint programs, we are especially pleased to have pulled this off.

The focus is on Swedish forest management, and the program will give students a close link to the Swedish

forest sector.

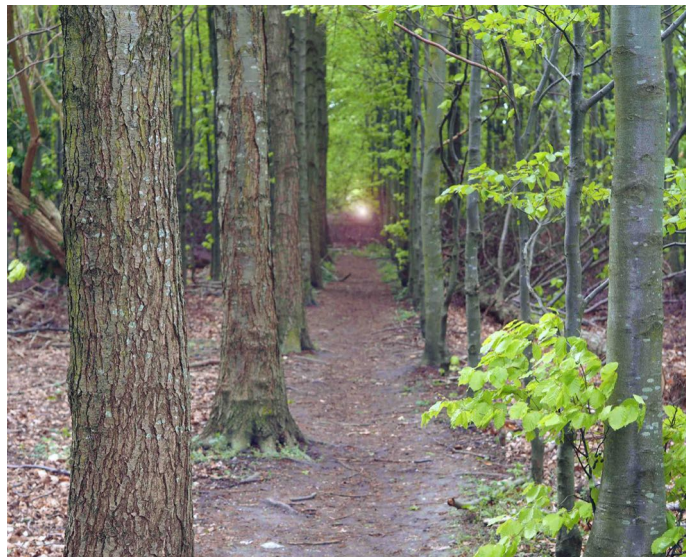
The first year will have courses on forestry and climate, conservation of forest biodiversity, research methods, and silviculture.

In the second year students can broaden or deepen their knowledge through elective courses, for example remote

sensing forest inventory, forest pathology or tree breeding. Although it is a distance program, there will be two or three required physical meetings per term in southern Sweden. Further, students will have the flexibility to study half- or full-time.

Matts Lindblad

A three-year program in forest and landscape



The landscape laboratory in Alnarp, where the forest meets the parkland. Its a park build from native species of trees instead of expensive exotic plants.

In 2019 the groundwork was laid for a new bachelors program to begin in the fall of 2021 called 'Forest and Landscape' (F&L).

The three-year program is taught in collaboration with the department of Landscape Architecture, and all instruction will be in English. F&L will focus on sustainable use and includes all stakeholders in forest landscapes.

Instruction will mix theoretical study with practical exercises, both in the field and indoors. In the first two years students will build a base of knowledge on forests and landscapes. They will

also acquire tools to plan and implement different forest activities. In the last year the students will specialize in forest, landscape, or society and policy.

The program finishes with a term of extensive independent projects and the opportunity for an internship at a company or NGO.

After three years there will be an option to continue with master's education or go directly to a career in forest and landscape.

Urban Nilsson

Research

Flying the flag

The flag has been raised in Alnarp. That means another doctoral student has reached the finish line.

On average three PhDs have been defended yearly at Southern Swedish Forest research centre.

When some PhDs finish, new ones join us. The graduate student body is always being renewed, and interest in the positions that we advertise is strong. In addition to personal guidance, we have joint doctoral courses as part of postgraduate education.

In 2019 we taught several different courses. In other words, doctoral education entails both education and independent work to build unique knowledge on a subject of interest.

The combination of independent work and collaboration among doctoral students is something that we care about.



Our growing alumni network shows that there are many paths toward careers in different areas.

The active network is also gives important feedback to help us focus on the right topics in our research and education.

Annika Felton

PhDs on their way

The first PhD student to defend in 2020 was Lisa Petersson. She defended on January 10 with the thesis "Replacing scots pine with norway spruce - implications for biodiversity in production forests". Many more are in route. At the turn of the year we had the following active doctoral students:

Emma Sandell, Mattias Engman, Adrian Villalobos, Isak Lodin, Oscar Nilsson, Guilherme Pinto, Martin Goude, Karin Amsten, Mikolaj Lula, Delphine Laviviere, Mostarin Ara, Khaled Youssef, Laura Juvany Canovas, Noelia López-García and Axelina Jonsson.



In December, Lisa Petersson added her thesis to the wall.

What happened next...

Finishing a PhD opens many doors. Of all who have defended at Southern Swedish forest research centre, about half work with forest-related topics at companies, organizations and agencies. Many have stayed within the academic world and some have moved to completely different fields.

Gisela Björse defended in 2000 and is now the director of silviculture at Sveaskog.

"Immediately after finishing my master's I started work as a PhD student in Alnarp and came to a very creative environment. It was a fun time. My thesis fell on the boundary between conservation and silviculture. I have continued to walk that line. After several years at the Swedish Forest Agency I came to Sveaskog where I have had several positions. My doctoral education has benefitted me in several ways, not just in terms of knowledge. I learned to assimilate scientific knowledge and joined a network of many good contacts."



Tobias Edman defended in 2008 and now works for the Swedish Space Agency.

"It may seem like a giant leap from the forest to space, but the pieces fell naturally into place. During my PhD years I learned the craft of scientific writing and to work with scientific techniques. That was unbelievably useful. After defending I worked as a GIS consultant for different organizations. Now I work on questions of how we can get more use from data from space. One of the things I keep working on is to build a national space lab with the Swedish Forest Agency as an important partner."



Tove Hultberg defended in 2015 and is now a natural resource manager at Söderåsen National Park.

"I came to Alnarp to learn about gardening, but realized that trees were more interesting, so I sought out the forestry department. My thesis was about the history of broadleaved forest which I mainly mapped through pollen analysis. It is unbelievably fascinating that you can go back thousands of years through the record in the soil! In addition to that knowledge, I learned important lessons about scientific approaches and having a network of colleagues. This benefits me in my daily work."



Mattias Berglund defended in 2005 and now is the chief of silviculture at Skogssällskapet.

"After my master's in forestry, I worked in the export department of a wood company. It was good work, but a bit too far from the forest. When I saw an announcement for a doctoral position it was as though it was talking directly to me. I came to Alnarp and got to dig into an interesting topic in an inspiring environment. After defending I worked in Alnarp for two years and thought about continuing with research I was passionate about. Nevertheless, I went to Skogssällskapet which I greatly enjoy, with an extra bonus of continuing to work in contact with the research community."



A record year for publications

Last year we published 77 peer-reviewed articles in international scientific journals. This is the highest amount in the history of Southern Swedish Forest Research centre.

Here is a list of publications in alphabetical order by first author. Researchers from SSFRC are in bold.

Aussenac, R., Bergeron, Y., Gravel, D., **Drobyshev, I.** Interactions among trees: A key element in the stabilising effect of species diversity on forest growth. *FUNCTIONAL ECOLOGY* 33: 360-367.

Barhoumi, C., ... **Drobyshev I.** et al. Gradually increasing forest fire activity during the Holocene in the northern Ural region (Komi Republic, Russia). *HOLOCENE* 29: 1906-1920.

Blondeel, H., ... **Brunet, J.** et al. Context-dependency of agricultural legacies in temperate forest soils. *ECOSYSTEMS* 22: 781-795.

Bravo, F., ... **Löf, M.** et al. Modelling approaches for mixed forests dynamics prognosis. Research gaps and opportunities. *FOREST SYSTEMS* 28: eR002.

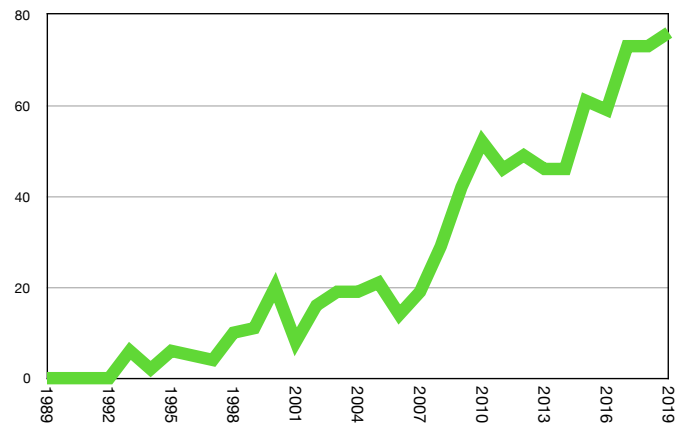
Cleary, M., Laas, M., Oskay, F., Drenkhan, R. First report of *Lecanosticta acicola* on non-native *Pinus mugo* in southern Sweden. *FOREST PATHOLOGY* 49: e12507.

Cleary, M. et al. Cryptic risks to forest biosecurity associated with the global movement of commercial seed. *FORESTS* 10: 459.

De Smedt, P., ... **Brunet, J.** et al. Forest edges reduce slug (but not snail) activity-density across Western Europe. *PEDOBIOLOGIA* 75: 34-37.

De Smedt, P., ... **Brunet, J.** et al. Strength of forest edge effects on litter-dwelling macro-arthropods across Europe is influenced by forest age and edge properties. *DIVERSITY AND DISTRIBUTIONS* 25: 963-974.

Depauw, L., ... **Brunet, J.** et al. Interactive effects of past land use and recent forest management on the understorey community in temperate oak forests in South Sweden. *JOURNAL OF VEGETATION SCIENCE* 30: 917-928.



Drobyshev, I., Picq, S., Ganivet, E., Tremblay, F., Bergeron, Y. Decline in the strength of genetic controls on aspen environmental responses from seasonal to century-long phenomena. *ECOSPHERE* 10: e02869.

Drobyshev, I., **Widerberg, M.K.**, Andersson, M., Wang, X., **Lindbladh, M.** Thinning around old oaks in spruce production forests: current practices show no positive effect on oak growth rates and need fine tuning. *SCANDINAVIAN JOURNAL OF FOREST RESEARCH* 34: 126-132.

Farooq, T.H., ... **Tigabu, M.** et al. Chinese fir (*Cunninghamia lanceolata*) a green gold of China with continued decline in its productivity over the successive rotations: A review. *APPLIED ECOLOGY AND ENVIRONMENTAL RESEARCH* 17: 11055-11067.

Farooq, T.H., ... **Tigabu, M.** et al. Growth, biomass production and root development of Chinese fir in relation to initial planting density. *FORESTS* 10: 236.

Fernandez-Fernandez, M., ... **Cleary, M.**, ... **Witzell, J.** Pine pitch canker and insects: Regional risks, environmental regulation, and practical management options. *FORESTS* 10: 649.

Fernandez-Fernandez, M., ... **Witzell, J.** et al. Pine pitch canker and insects: Relationships and implications for disease spread in Europe. *FORESTS* 10: 627.



Prefect Vilis Brukas in happy conversation with Euroforester students at the traditional term-end party in the garden.



Term-end festivities include grilling. PM Ekö takes care of business, and his barbecue sauce recipe never fails him

Festin, E.S., Salk, C., Tigabu, M., Syampungani, S., **Odén, P.-C.** Biological traits of tropical trees suitable for restoration of copper-polluted lands. *ECOLOGICAL ENGINEERING* 138: 118-125.

Festin, E.S., Tigabu, M., Chileshe, M.N., Syampungani, S., **Odén, P.-C.** Progresses in restoration of post-mining landscape in Africa. *JOURNAL OF FORESTRY RESEARCH* 30: 381-396.

Fransson, P., **Nilsson, U.,** Lindroos, O., Franklin, O. Brännström, Å. Model-based investigation on the effects of spatial evenness, and size selection in thinning of *Picea abies* stands. *SCANDINAVIAN JOURNAL OF FOREST RESEARCH* 34: 189-199.

Fredh, E.D., **Lindbladh, M.** et al. Farm establishment, abandonment and agricultural practices during the last 1,300 years: a case study from southern Sweden based on pollen records and the LOVE model. *VEGETATION HISTORY AND ARCHAEOBOTANY* 28: 529-544.

Gonzalez-Moreno, P., ... **Romeralo, C., Witzell, J.** et al. Consistency of impact assessment protocols for non-native species. *NEOBIOTA* 44: 1-25.

Goude, M., Nilsson, U., Holmström, E. Comparing direct and indirect leaf area measurements for Scots pine and Norway spruce plantations in Sweden. *EUROPEAN JOURNAL OF FOREST RESEARCH* 138: 1033-1047.

Hedwall, P.-O. Brunet, J., Diekmann, M. With Ellenberg indicator values towards the north: Does the indicative power decrease with distance from Central Europe? *JOURNAL OF BIOGEOGRAPHY* 46: 1041-1053.

Hedwall, P.-O., ... Brunet, J., Lindbladh, M. et al. Half a century of multiple anthropogenic stressors has altered northern forest understory plant communities. *ECOLOGICAL APPLICATIONS* 29: e01874.

Hedwall, P.-O., Holmström, E., Lindbladh, M., Felton, A. Concealed by darkness: How stand density can override the biodiversity benefits of mixed forests. *ECOSPHERE* 10: e02835.

Helsen, K., ... **Brunet, J.** et al. No genetic erosion after five generations for *Impatiens glandulifera* populations across the invaded range in Europe. *BMC GENETICS* 20: 20.

Hjelm, K., **Nilsson, U.,** Johansson, U., **Nordin, P.** Effects of mechanical site preparation and slash removal on long-term productivity of conifer plantations in Sweden. *CANADIAN JOURNAL OF FOREST RESEARCH* 49: 1311-1319.

Hofgaard, A., ... **Drobyshev, I.** et al. Non-stationary response of tree growth to climate trends along the Arctic margin. *ECOSYSTEMS* 22: 434-451.

Holmström, E., Galnander, H., Petersson, M. Within-site variation in seedling survival in Norway spruce plantations. *FORESTS* 10: 181.
Hou, X., ... **Tigabu, M.** et al. Changes in soil physico-chemical properties following vegetation restoration mediate bacterial community composition and diversity in Changting, China. *ECOLOGICAL ENGINEERING* 138: 171-179.

Jonsell, M., Abrahamsson, M., Widenfalk, L., **Lindbladh, M.** Increasing influence of the surrounding landscape on saproxylic beetle communities over 10 years succession in dead wood. *FOREST ECOLOGY AND MANAGEMENT* 440: 267-284.

Kedra, K., **Barbeito, I.,** Dassot, M., Vallet, P., Gazda, A. Single-image photogrammetry for deriving tree architectural traits in mature forest stands: a comparison with terrestrial laser scanning. *ANNALS OF FOREST SCIENCE* 76: 5.

Kitenberga, M., **Drobyshev, I., Niklasson, M.** et al. A mixture of human and climatic effects shapes the 250-year long fire history of a semi-natural pine dominated landscape of Northern Latvia. *FOREST ECOLOGY AND MANAGEMENT* 441: 192-201.

Li, Y., Zhou, C., Qiu, Y., **Tigabu, M.,** Ma, X. Effects of biochar and litter on carbon and nitrogen mineralization and soil microbial community structure in a China fir plantation. *JOURNAL OF FORESTRY RESEARCH* 30: 1913-1923.

Lim, H., ... **Linder, S.** Boreal forest biomass accumulation is not increased by two decades of soil warming. *NATURE CLIMATE CHANGE* 9: 49.

Lindbladh, M., Petersson, L., Hedwall, P.-O., Trubins, R., Holmström, E., Felton, A. Consequences for bird diversity from a decrease in a foundation species replacing Scots pine stands with Norway spruce in southern Sweden. *REGIONAL ENVIRONMENTAL CHANGE* 19: 1429-1440.



PhD student Delphine Lariviere presents results about shelterwood management during an excursion to Raslängen eco-park arranged by us in June 2019



Mikolaj Lula studies regeneration of pine. He is one of six PhD students in the FRAS program which looks at pathways for future silviculture.

Linkevicius, E., ... **Brukas, V.** et al. Linking forest policy issues and decision support tools in Europe. *FOREST POLICY AND ECONOMICS* 103: 4-16.

Löf, M., ... **Engman, M.**, **Villalobos, A.** et al. Tamm Review: Direct seeding to restore oak (*Quercus* spp.) forests and woodlands. *FOREST ECOLOGY AND MANAGEMENT* 448: 474-489.

Löf, M., Madsen, P., Metslaid, M., **Witzell, J.**, Jacobs, D.F. Restoring forests: regeneration and ecosystem function for the future. *NEW FORESTS* 50: 139-151.

Ma, S., ... **Brunet, J.** et al. Plant-soil feedbacks of forest understorey plants transplanted in nonlocal soils along a latitudinal gradient. *PLANT BIOLOGY* 21: 677-687.

Ma, S., ... **Brunet, J.** et al. Plant species identity and soil characteristics determine rhizosphere soil bacteria community composition in European temperate forests. *FEMS MICROBIOLOGY ECOLOGY* 95: fiz063.

Ma, S., ... **Brunet, J.** et al. Local soil characteristics determine the microbial communities under forest understorey plants along a latitudinal gradient. *BASIC AND APPLIED ECOLOGY* 36: 34-44.

Ma, Y., **Tigabu, M.** et al. Water-soluble inorganic ions in fine particulate emission during forest fires in Chinese Boreal and Subtropical forests: An indoor experiment. *FORESTS* 10: 994.

Maes, S., ... **Brunet, J.** et al. Litter quality, land-use history, and nitrogen deposition effects on topsoil conditions across European temperate deciduous forests. *FOREST ECOLOGY AND MANAGEMENT* 433: 405-418.

Maes, S., ... **Brunet, J.** et al. Environmental drivers interactively affect individual tree growth across temperate European forests. *GLOBAL CHANGE BIOLOGY* 25: 201-217.

Makrickiene, E., **Brukas, V.** et al. From command-and-control to good forest governance: A critical interpretive analysis of Lithuania and Slovakia. *FOREST POLICY AND ECONOMICS*: 109: 102024.

Malmsten, J., ... **Felton, A.M.** Vector-borne zoonotic pathogens in Eurasian moose (*Alces alces alces*). *VECTOR-BORNE AND ZOONOTIC DISEASES* 19: 207-211.

Martinez-Arias, C., Macaya-Sanz, D., **Witzell, J.**, Martin, J. A. Enhancement of *Populus alba* tolerance to *Venturia tremulae* upon inoculation with endophytes showing in vitro biocontrol potential. *EUROPEAN JOURNAL OF PLANT PATHOLOGY* 153: 1031-1042.

Morales-Rodriguez, C., ... **Witzell, J.**, **Cleary, M.** et al. Forewarned is forearmed: harmonized approaches for early detection of potentially invasive pests and pathogens in sentinel plantings. *NEOBIOTA* 47: 95-123.

Mozgeris, G., **Brukas, V.** et al. Spatial pattern of climate change effects on Lithuanian forestry. *FORESTS* 10: 809.

Mozgeris, G., Kavaliauskas, M., **Brukas, V.**, Stanislovaitis, A. Assessment of timber supply under alternative contextual scenarios. *FOREST POLICY AND ECONOMICS* 103: 36-44.

Nordén, B., Rorstad, P.K., Magner, J. Götmark, F., **Löf, M.** The economy of selective cutting in recent mixed stands during restoration of temperate deciduous forest. *SCANDINAVIAN JOURNAL OF FOREST RESEARCH* 34: 709-717.

Nordström, E.-M., ... **Felton, A.**, **Lindbladh, M.**, **Lodin, I.** et al. Forest decision support systems for the analysis of ecosystem services provisioning at the landscape scale under global climate and market change scenarios. *EUROPEAN JOURNAL OF FOREST RESEARCH* 138: 561-581.

Pettersson, L.K., Milberg, P., Bergstedt, J., Dahlgren, J., **Felton, A.M.**, Götmark, F., **Salk, C.**, **Löf, M.** Changing land use and increasing abundance of deer cause natural regeneration failure of oaks: Six decades of landscape-scale evidence. *FOREST ECOLOGY AND MANAGEMENT* 444: 299-307.

Pettersson, L., **Holmström, E.**, **Lindbladh, M.**, **Felton, A.** Tree species impact on understorey vegetation: Vascular plant communities of Scots pine and Norway spruce managed stands in northern Europe. *FOREST ECOLOGY AND MANAGEMENT* 448: 330-345.

Pettersson, M., Frampton, J., **Rönnerberg, J.**, Brurberg, M.B., Talgo, V. Presence of *Phytophthora* species in Swedish Christmas tree plantations. *EUROPEAN JOURNAL OF PLANT PATHOLOGY* 153: 1221-1236.



In early April Johanna Witzell received the Guldkvisten prize from King Carl XVI Gustav. The prize is given by the organization Skogen to people who have made valuable national contributions to forests and forestry. Johanna's research is about minimizing the effects of harmful pathogens and insects. The organization's general secretary, Bengt Ek, emphasizes that she is making an outstanding contribution to this field. Photo: Johan Marklund.



Tove Hultberg took part in the excursion on deciduous trees and nature conservation; she talked about the history of linden trees.

Pretzsch, H., ... **Nilsson, U.** et al. Maintenance of long-term experiments for unique insights into forest growth dynamics and trends: review and perspectives. EUROPEAN JOURNAL OF FOREST RESEARCH 138: 165-185.

Reventlow, D.O.J., Nord-Larsen, T., **Skovsgaard, J.-P.** Pre-commercial thinning in naturally regenerated stands of European beech (*Fagus sylvatica* L.): effects of thinning pattern, stand density and pruning on tree growth and stem quality. FORESTRY 92: 120-132.

Sahlin, E., Johansson, B., Karlsson, P.-O., Loberg, J., **Niklasson, M.**, Grahn, P. Improved wellbeing for both caretakers and users from a zoo-related nature based intervention - a study at Nordens Ark zoo, Sweden. International Journal of Environmental Research and Public Health 16: 4929.

Spitzer, R., Churski, M., **Felton, A.M.** et al. Doubting dung: eDNA reveals high rates of misidentification in diverse European ungulate communities. EUROPEAN JOURNAL OF WILDLIFE RESEARCH 65: 28.

Stens, A., ... **Felton, A., Nilsson, U.** et al. From ecological knowledge to conservation policy: a case study on green tree retention and continuous-cover forestry in Sweden. BIODIVERSITY AND CONSERVATION 28: 3547-3574.

Su, Z., Hu, H., **Tigabu, M.**, Wang, G., Zeng, A., Guo, F. Geographically weighted negative binomial regression model predicts wildfire occurrence in the Great Xing'an Mountains better than negative binomial model. FORESTS 10: 377.

Su, Z., **Tigabu, M.**, Cao, Q., Wang, G., Hu, H., Guo, F. Comparative analysis of spatial variation in forest fire drivers between boreal and subtropical ecosystems in China. FOREST ECOLOGY AND MANAGEMENT 454: 117669.

Subramanian, N., Nilsson, U., Mossberg, M., Bergh, J. Impacts of climate change, weather extremes and alternative strategies in managed forests. ECOSCIENCE 26: 53-70.

Taerøe, A., de Koning, J.H.C., **Löf, M.**, Tolvanen, A., Heidarsson, L., Raulund-Rasmussen, K. Recovery of temperate and boreal forests after windthrow and the impacts of salvage logging. A quantitative review. FOREST ECOLOGY AND MANAGEMENT 446: 304-316.

Tedersoo, L., Drenkhan, R., Anslan, S., Morales-Rodriguez, C., **Cleary, M.** High-throughput identification and diagnostics of pathogens and pests: Overview and practical recommendations. MOLECULAR ECOLOGY RESOURCES 19: 47-76.

Tigabu, M., Daneshvar, A., Ren J., Wu, P., Ma, X., **Odén, P.-C.** Multivariate discriminant analysis of single seed near infrared spectra for sorting dead-filled and viable seeds of three pine species: Does one model fit all species? FORESTS 10: 469.

Trubins, R., Jonsson, R., **Wallin, I., Sallnäs, O.** Explicating behavioral assumptions in forest scenario modelling - the behavioral matrix approach. FOREST POLICY AND ECONOMICS 103: 70-78.

Vainio, E.J., ... **Cleary, M, Romeralo, C** et al. Sampling and detection strategies for the pine pitch canker (PPC) disease pathogen *Fusarium circinatum* in Europe. FORESTS 10: 723.

Vanneste, T., ... **Brunet, J.** et al. 2019. Functional trait variation of forest understorey plant communities across Europe. Basic and Applied Ecology 34: 1-14.

Vauhkonen, J., ... **Trubins, R.** et al. Harmonised projections of future forest resources in Europe. ANNALS OF FOREST SCIENCE 76: 79.

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Euroforesters on an excursion in a birch forest.



Ulf Johansson, of Tönnersjöheden Research Park, tells about research results to an audience during an excursion as part of the FRAS program in Remmingstorp.