Report for annual networks

Submit the report to sns@slu.se by 24:00 CET, 1st of March the year after the activities.
The report should not exceed 2000 words.

Please adjust the size of the boxes to the length of your answer.

1. Title of the network:	Nordic growth and yield researchers network
2. Network number:	N2019-05

3. Main applicant:	Saija Huuskonen
Email:	Saija.huuskonen@luke.fi
Address:	Natural Resources Institute Finland (Luke) Natural Resources unit Latokartanonkaari 9 FI-00790 Helsinki, Finland

Activities

4. Place of the activity:	Vierumäki, Finland
Duration of the activity (start date, end date):	11th to 13th June 2019

5. Provide a short network summary, including:

a) The purpose of the project/main problems/background

The long-term aim of our network is to maintain existing interaction and promote new co-operation between forest Growth and Yield (G&Y) researchers in the Nordic and Baltic countries. The G&Y Network shares research results, experiences, and discuss research challenges concerning forest development and forest management alternatives under changing environment. Today, the forest sector meets various challenges, and strong co-operation and sharing of research-based knowledge is highly needed, maybe more than ever. Especially, G&Y research plays a vital role in meeting the demands of bioeconomy by providing simulation results for sustainable and multifunctional forest management alternatives.

G&Y Nordic network meetings have been arranged since the 1960's. Currently our network includes also the Baltic countries. During the last ten years G&Y researches have met regularly. The general aims of the network have remained the same, whereas the themes have varied from one meeting to the other.

b) A description of the main activities of the network

An open conference "Forest management for the future Nordic/Baltic forests – Long-term experiments answering to today's questions" was organized in Finland 11th to 13th of June 2019. Totally 35 participants were represented from 8 organizations and 14 nationalities.

Program outline was as follows:

Tuesday 11th of June

11.30	Bus transportation from Helsinki-Vantaa Airport Lunch sandwich served in bus
13.00	Long term forest experiment at Vierumäki. **Norway spruce thinning trial**, measured repeatedly since 1961, stand age 97 years. *Jari Hynynen, Luke*
14:00	Bus to Vierumäki Resort Hotel Check-in to hotel
	Indoor presentations, meeting room KATAJA
15:00	Stand growth models validation on permanent sample plot data in Estonia, *Andres Kiviste, EMU*
15:20	Modelling long-term diameter growth of Norway spruce clones in low-density plantation, *Pauls Zeltins, SILAVA*
15:35	Hybrid growth and yield models for Sweden, *Martin Goude, SLU*
15:50	Coffee break & Poster presentations
16:30	Growth and density of Norway spruce in Norway, *Micky Allen NIBIO*
16:45	Modelling the effects of regeneration method on growth and economy of Scots Pine stands, *Mikolaj Lula, SLU*
17:00	Estimation of dominant height growth changes in boreal coniferous forests using long-term experimental data, *Alex Appiah Mensah, SLU*
17:15	Forest production in response to N fertilisation and precipitation, *Hyungwoo Lim, SLU*
17:30	Use of stable isotopes and nitrogen fixation to explain growth reactions of Scots pine and Norway spruce, *Oscar Nilsson, SLU*
17:45	Stem cracks in Norway spruce (Picea abies (L.) Karst.) provenance trial in Estonia, *Sandra Metslaid, EMU*
18.00–21.00	Dinner available

Posters will be presented on Tuesday and Thursday

Artis Becs	*SLU*	Prerequisites for biomass production from small-diameter trees in Swedish forestry
Janis Liepins	*SILAVA*	Biomass studies for the most common tree species in Latvia
Guntars Snepsts	*SILAVA*	Dominant height growth models for Scots pine Pinus sylvestris L. in stands on dry mineral soils in Latvia.
Leonids Zdors	*SILAVA*	Initial growth of planted and naturally regenerated Scots pine seedlings in uniform shelterwood stands

Wednesday 12th of June

8.30	Bus to Vesijako Research Forest area
9.30	**Heikinheimo slash and burn site.** Area was slashed and burned in 1917 and pine seeded in 1918. Experiment was established in 1948 and plots have been measured since then regularly. *Saija Huuskonen and Jouni Siipilehto, Luke*
10.30	**Unevenaged experiment.** Intensive experiment of uneven aged spruce stand with different intensities of selection cutting. Experiment has been established in 1992 and measured since then regularly. *Sauli Valkonen and Jari Hynynen, Luke* Tree level growth dynamics of Norway spruce under different management systems *Simone Bianchi, Luke*
12.00	Lunch in the forest
13.00	**Precommercial thinning experiment.** Scots pine PCT thinning trial with different PCT timing and intensities established in 1978 and measured since then regularly. Stand age 58 year. *Saija Huuskonen, Luke*
14.00	**Heavy thinnings.** Scots pine thinning trial with two intensities and three thinning types. New experiment, measured first 10 year period. *Pentti Niemistö, Luke* Enhancing understanding about effects of silvicultural practices on tree architecture with terrestrial laser scanning. *Ninni Saarinen, UH*
15.00	**Birch experiment.** Silver birch thinning trial with different thinning intensities. Stand was planted in 1970 and experiment established in 1990, and measured since then regularly. *Pentti Niemistö, Luke*
16.00–17.00	Bus to Vierumäki
18.00–20.00	Lakeshore sauna, possibility to swim in lake Valkjärvi
20.00–22.00	Conference dinner

Thursday 13th of June

	Indoor presentations, meeting room HELSINKI
8:00	Mixed forest, complications and opportunities, *Emma Holmström, SLU*
8:20	The productivity and management of mixed two-layered birch and spruce stands in Latvia, *Jānis Vuguls, SILAVA*
8:35	Management alternatives of spontaneously regenerated mixed stands of Birch and Norway spruce in Sweden, *Felicia Lidman, SLU*
8:50	Thinning reactions in mixed stands of Norway spruce and Scots pine in Norway, *Silke Houtmeyers, NMBU*
9:05	Different planting designs yield no effect on the growth of coniferous forest plantation in Sweden, *Mostarin Ara, SLU*
9:20	Assessment of spatial stand structure of conifer dominated forests with different levels of naturalness: a study based on forest permanent plots in Estonia, *Eneli Põldveer & Laura Peedosaar, EMU*
9:35	Coffee break & Poster presentations
10:10	Understanding effects of tree size inequality on forest stand productivity: Ontogenetic trends in crown volume efficiency and light use efficiency, *Andreas Brunner, NMBU*
10:30	Wood production forecast for Western Iceland, *Ellert Marísson SKÓGRÆKTIN*
10:45	Long term yield experiments in pine and spruce stands in Lithuania*, Lina Beniušienė & Edgaras Linkevičius,* VMU
11:00	**Discussion, closing remarks, next meeting 2021**
12.00	Lunch
13.00–14.30	Bus transportation to Helsinki-Vantaa airport

Outcome

6. Published outputs achieved as a consequence of the network (peer-reviewed articles, other publications)
For this kind of network the main aim is not to provide peer reviewed articles, but to increase collaboration and thus in future projects that may provide also scientific articles. As a one publishable output, all the conference presentations (indoor and outdoor presentations) were shared in electronic format to all participants.

7. Other practical outputs of the project (workshops, conferences, scientific meetings, policy recommendations, conferences, large-scale project applications, databases or websites etc.)
The main practical output of this network was a conference to share the current knowledge on G&Y. The event was an important step towards common understanding of Nordic/Baltic G&Y research challenges. The conference actions were presented in social media: https://twitter.com/HuuskonenSaija/status/1138842923183890433 https://twitter.com/HuuskonenSaija/status/1138841348684075008 https://twitter.com/HuuskonenSaija/status/1138719658939432961 https://twitter.com/HuuskonenSaija/status/1138412303580303360 Based on the discussions and theme of conference, a blog entry (in Finnish) was written by Saija Huuskonen: https://www.luke.fi/blogi/metsankasvatuksen-pitkaaikaiskokeet-vastaavat-huomisen-kysymyksiin/ Press was also involved in the field excursions: Padasjoen sanomat (local newspaper) and Metsälehti (forestry journal). They wrote news article and interviewed participants. .

8. How and within which areas was the network beneficial for the Nordic region?
This network and conference enabled a wide and deep discussion of current knowledge in growth and yield research, and the identification of gaps. As a one result, we agreed to prepare a Tandem Forest value application with SLU (Sweden) & Luke (Finland). The application was funded and the project will begin on the 1st of April 2020. The project title is: "Mixed-forest Management: Diversity to forests and bioeconomy (ManDi)".

* Nordic is defined here as Denmark, Finland, Iceland, Norway, Sweden and the autonomous areas of the Faroe Islands, Greenland and Åland Islands.

9. Provide a popular science piece for dissemination in SNS' various channels (maximum 700 words) with emphasis on application of results and benefits for the Nordic society. Provide pictures (size at least 500x500 pixels and resolution at least 72 pixels) as separate files (.jpg). Include caption to each picture, including the name of photographer.
The aim of Nordic Growth and Yield researchers Network is to maintain existing interaction and promote new co-operation between forest Growth and Yield (G&Y) researchers in the Nordic and Baltic countries. The G&Y Network shares research results, experiences, and discuss research challenges concerning the forest development and forest management alternatives under changing environment. Today, forest sector meets various challenges, and a strong co-operation and sharing of research-based knowledge is highly needed, maybe more than ever. Especially, G&Y research plays a vital role in meeting the demands of bioeconomy by providing simulation results for sustainable and multifunctional forest management alternatives. G&Y Nordic network meetings have been arranged since 1960's. Currently our network includes also the Baltic countries. During the last ten years G&Y researches have met regularly. The general aims of the network have remained the same, whereas the themes have varied from one meeting to the other. G&Y2019 network focused on the value, maintenance, and more efficient use of the data from long-term forest experiments. Plenty of

valuable long-term experiments exist in the Nordic network countries. Many of them are internationally recognised and unique experimental forest stands having long monitoring periods, even more than a hundred years. These "real gems" and their potential for the future research was indeed worth of discussion.

G&Y2019 network arranged a conference in Finland. The conference was as an important platform for researchers to meet and to discuss scientific questions, to share research-based knowledge, to build networks, and to work out ideas for new research applications and projects. As a concrete result of active network, a joint Tandem application was prepared, and the project will begin in spring 2020.

Maintaining an active and effective G&Y network is a continuous process. We agreed that the next conference will be organized in Latvia by SILAVA in 2021. We are looking forward to continue active collaboration and networking in the future also.

Participation and inclusion in the network activities

10. Participants								
Country	**PhD students & Post-docs**	**Senior researchers**	**Stakeholders**	**Communication officers**	**Gender**			**Total**
					Women	Men	Other	
Denmark								
Finland	2	6			3	5		8
Iceland								
Norway	1	2			1	2		3
Sweden	8	3			4	7		11
Estonia	3	3			3	3		6
Latvia	4	1				5		5
Lithuania	1	1			1	1		2
…								
…								
…								
Total	19	16			12	23		35

Economic report

11. Received grant from SNS (SEK):
200 000 SEK

12. Costs	SNS funding	Co-financing	Total
Travel and accommodation	90 405.15	71 936.59	162 341.74
Meeting costs	79 869.90		79 869.90
Communication			
Other costs (specify)			
Salary		441 828.93	441 828.93
Total SUM (SEK)	**170 275.05**	**492 700.74**	**662 975.79**

13. Allocation of SNS funding		
Country	**Partner organization**	**% of total**
Finland	LUKE	82.37
Sweden	SLU	2.44
Norway	NIBIO, NMBU	1.33
Estonia	EMU	5.34
Latvia	SILAVA	5.73
Lithuania	VMU	2.78
Total SUM	**170 275.05 SEK**	

14. Economic result (deficit or surplus)
+29 724.95 SEK

Optional: Comments to the economic reporting
Table 12: Co-funding is based on given information by partner countries. Table 13: All costs related to conference in Finland (e.g. accommodation and travels in Finland for all participants (all countries) are included in row "Luke and Finland" costs. Funding allocated to other countries are PhD students travel costs to Finland. Swedish BECFOR research school paid 6 PhD students travel costs.

I hereby declare that the above statements are true to the best of my knowledge

Signature of the main applicant

Signature	Institution	Date
	LUKE	28.2.2020

SAIJA HUUSKONEN

Printed name

Signature of the department head at the department of the main applicant

Signature	Institution	Date
	LUKE	2.3.2020

Eeva-Liisa Ryhänen

Printed name

Second applicant's signature, place and date

Signature	Institution	Date
	Dep. of Southern Swedish Forest Research Centre, SLU	28/2 - 2020

URBAN NILSSON

Printed name

Third applicant's signature, place and date

Signature	Institution	Date
	NIBIO	28-02-2020

Micky Allen

Printed name

Note: At application phase this was signed by Kjell Andreassen, who is now retired, and thus now signed by Micky Allen from NIBIO.