

## Annual report for SNS Centre of Advanced Research (CAR)

Submit the annual report to [sns@slu.se](mailto:sns@slu.se) by 24:00 CET, 1<sup>st</sup> of March at the latest.  
The report should not exceed 2000 words (including words in the template).

Please adjust the box size according to the length of your answer.

1. Project title:	HealGenCAR
2. Reporting year:	2019
3. Project coordinator:	Tuija Aronen
Email:	tuija.aronen@luke.fi
Address:	Vipusenkuja 5, FI-57200 Savonlinna, Finland

### Activities during the reporting year:

<p>4. Project status</p> <p>a) Does the project develop according to the plans? b) Describe the activities during the reporting year.</p> <p>a) HealGenCar has developed according to the realization plan in 2019.</p> <p>b) In 2019, The Future Forest Health Conference "Early detection and mitigation of invasive pests and diseases in Nordic forests" included in the <i>Realization plan</i> was organized in Hveragerði, South Iceland, 17-18 September. The conference was arranged back-to-back with an SNS matchmaking day for networking researchers in Reykjavik. The core group had three meetings, and allocated resources to applied activities that were realized in 2019 or will take place in 2020. As <i>Applied activities</i> the following events were supported: The Meeting "Forests and Fields in Climate Change" was arranged in Oulu, Finland, 18-19 March. The meeting brought together both young and experienced researchers in plant climatic adaptation, forest genetics, tree breeding, genetics and breeding of agricultural plant species and plant pathology. Seed Orchard Management Workshop was organized by Siemen Forelia in Jyväskylä, Finland, 10-12 September. A silvicultural field trip of the Silviculture club of the Finnish Society of Forest Science to Central Sweden was arranged together with Sveaskog, SLU and Skogforsk in 23-24, September. The visit by Miguel Nemesio-Gorritz from Teagasc, Ireland, to Denmark concerning ash-dieback was realized in 13-15, May. The HealGenCAR web-pages were updated. Scientific research on the field of HealGenCAR was active and produced many publications in 2019.</p>
---

### 5. List the published outputs during the reporting year (peer-reviewed articles, other publications):

Calleja-Rodriguez A., Andersson Gull B., Wu H. X., Mullin T. J. & Persson T. 2019. Genotype-by-environment interactions and the dynamic relationship between tree vitality and height in northern *Pinus sylvestris*. *Tree Genetics & Genome* 15:36. <https://doi.org/10.1007/s11295-019-1343-8>

Di, B., Luoranen, J., Lehto, T., Himanen, K., Silvennoinen, M., Silvennoinen, R., Repo, T. 2019. Biophysical changes in the roots of Scots pine seedlings during cold acclimation and after frost damage. *Forest Ecology and Management* 431: 63-72.

Edesi, J., Tolonen, J., Ruotsalainen, A.L., Aspi, J., Häggman, H. 2019. Cryopreservation enables long-term conservation of critically endangered species *Rubus humulifolius*. *Biodiversity and Conservation* 29 1: 303-314.

Ekholm, A., Tack, A. J. M., Pulkkinen, P., Roslin, T. 2019. Host plant phenology, insect outbreaks and herbivore communities – The importance of timing. *Journal of Animal Ecology*:

Erbilgin, N.; Klutsch, J. G.; Najeeb, H.; Cale, J. A.; Ishangulyyeva, G.; Rajabzadeh, R.; Boone, C.; Bozic, T.; Jansson, G.; Haapanen, M.; Hughes, C.; MacQuarrie, C. J. K.; Schroeder, M.; Seppo, R. 2019. Chemical similarity between introduced and native populations of Scots pine can facilitate transcontinental expansion of mountain pine beetle in North America. *Biological Invasions*: 17 p.

Elvira-Recuenco, M., Olga-Cacciola, S., Sanz-Ros, A., Garbelotto, M., Aguayo, J., Solla, A., Mullet, M., Drenkhan, T., Oskay, F., Aday Kaya, A.G., Iturritxa, E., Cleary, M., Witzell, J., Georgieva, M., Papazova-Anakieva, I., Chira, D., Paraschiv, M., Musolin, D.L., Selikhovkin, A.V., Varentsova, E.Yu., Adamcikova, K., Markovskaja, S., Mesanza, N., Davydenko, K., Capretti, P., Scanu, B., Gonthier, P., Tsopelas, P., Martín-García, J., Morales-Rodríguez, C., Lehtijärvi, A., Dogmus Lehtijärvi, H.T., Oszako, T., Nowakowska, J.A., Bragança, H., Fernández- Fernández, M., Hantula, J. & Díez J.J. 2020. Potential interactions between invasive *Fusarium circinatum* and other pine pathogens in Europe. *Forests* 11, 7

Kosawang C., Sørensen H., Kjær E.D., Dilokpimol A., McKinney L.V., Collinge D.B., **Nielsen L.R.** 2019. Defining the twig fungal communities of *Fraxinus* species and *Fraxinus excelsior* genotypes with differences in susceptibility to ash dieback. *Fungal Ecology* 42: 100859.

Luoranen, J., Pikkarainen, L., Poteri M., Peltola, H. & Riikonen, J. 2019. Duration Limits on Field Storage in Closed Cardboard Boxes before Planting of Norway Spruce and Scots Pine Container Seedlings in Different Planting Seasons. *Forests* 2019, 10(12), 1126

Mohsin, M., Kuittinen, S., Salam, M.M.A., Peräniemi, S., Laine, S., Pulkkinen, P., Kaipainen, E., Vepsäläinen, J., Pappinen, A. 2019. Chelate-assisted phytoextraction: Growth and ecophysiological responses by *Salix schwerinii* E.L Wolf grown in artificially polluted soils. *Journal of Geochemical Exploration* 205:10 p.

Moreira, X., Abdala-Roberts, L., Bruun, H. H., Covelo, F., De Frenne, P., Galmán, A., Gaytán, Á., Jaatinen, R., Pulkkinen, P., Ten Hoopen, J. P. J. G., Timmermans, B.G.H., Tack, A. J. M., Castagneyrol, B. 2019. Latitudinal variation in seed predation correlates with latitudinal variation in seed defensive and nutritional traits in a widespread oak species. *Annals of Botany*.

Rousi, M., Possen, B. J.M.H., Pulkkinen, P., Mikola, J. 2019. Using long-term data to reveal the geographical variation in timing and quantity of pollen and seed production in silver and pubescent birch in Finland: Implications for gene flow, hybridization and responses to climate warming. *Forest Ecology and Management* 438: 25-33.

Salam, M.M.A., Mohsin, M., Kaipainen, E., Villa, A., Kuittinen, S., Pulkkinen, P., Pelkonen, P., Pappinen, A. 2019. Biomass growth variation and phytoextraction potential of four *Salix* varieties grown in contaminated soil amended with lime and wood ash. *International Journal of Phytoremediation* 21.

Salam, M. M. A., Mohsin, M., Pulkkinen, P., Pelkonen, P., Pappinen, A. 2019. Effects of soil amendments on the growth response and phytoextraction capability of a willow variety (*S. viminalis* × *S. schwerinii* × *S. dasyclados*) grown in contaminated soils. *Ecotoxicology and Environmental Safety* 171: 753-770.

Semizer-Cuming D., Finkeldey R., **Nielsen L.R.**, Kjær E.D. 2019. Negative correlation between ash dieback susceptibility and reproductive success: good news for European ash forests. *Annals of Forest Science*

79:16.

Tikkinen M., Varis S., Välimäki S., Nikkanen O. & Aronen T. 2019. Somatic embryogenesis of Norway spruce in Finland – seven years from start to first commercial pilots. In: Bonga JM, Park YS, Trontin JF (eds) Proceedings of the 5th international Conference of the IUFRO Unit 2.09.02 on "Clonal Trees in the Bioeconomy Age: Opportunities and Challenges", September 10-15, 2018. Coimbra, Portugal., p. 166-172. <https://www.iufro.org/science/divisions/division-2/20000/20900/20902/publications>

Zamora-Ballesteros, C., Diez, J.J., Martín-García, J., Witzell, J., Solla, A., Ahumada, R., Capretti, P., Cleary, M., Drenkhan, R., Dvorak, M., Elvira-Recuenco, M., Fernández- Fernández, M., Ghelardini, L., Gontrier, P., Hernandez-Escribano, L., Ios, R., Markovskaja, S., Martínez-Alvarez, P., Muñoz-Adalia, E.J., Nowakowska, J.A., Oszako, T., Raposo, R., Santini, A. & Hantula, J. 2019. Pine Pitch Canker (PPC): pathways of disease spread and preventive measures. *Forests* 10, 1158

Wu, D., Kukkonen, S., Luoranen, J., Pulkkinen, P., Heinonen, J., Pappinen, A., Repo, T. 2019. Influence of late autumn preconditioning temperature on frost hardiness of apple, blueberry and blackcurrant saplings. *Scientia Horticulturae* 258: 9 p.

6. List other practical outputs during the reporting year (websites, policy recommendations, conferences, scientific meetings, large-scale project applications, research training etc.)

- Application to Horizon2020 "Tackling emerging threats to European forests using biocontrol & genomic solutions" was prepared, total sum 7 million euros. Participants from Finland, Sweden and Norway were included.
- Project application was developed "Adaptability of *Fraxinus excelsior* from different European sources" as a result of the visit of Miguel Nemesio-Gorriz to Denmark
- HealGenCAR web-pages were updated
- Training and exchange of knowledge of researchers concerning ash dieback was promoted by the visit of Dr Miguel Nemesio-Gorriz (Teagasc, Ireland) to the University of Copenhagen, May 13-15.
- Exchange of knowledge between researchers and practical operators was promoted by supporting the Seed Orchard Management Workshop organized by Siemen Forelia in Finland, September 10-12, and the visit of the Silviculture club of the Finnish Society of Forest Science to Central Sweden organized by Sveaskog, SLU and Skogforsk, September 23-24. The visit was communicated in a Finnish trade journal.
- The Future Forest Health Conference "Early detection and mitigation of invasive pests and diseases in Nordic forests" was organized in Iceland, 17-18 September, back to back with an SNS matchmaking day
- The Meeting "Forests and Fields in Climate Change" organized in Oulu, Finland, 18-19 March, brought together both young and experienced researchers.
- Co-operation of Nordic colleagues on experiments of *Larix* insects was facilitated in Denmark in April
- A manuscript on ash dieback and emerald ash borer was prepared and accepted for a special issue of *Forestry: An International Journal of Forest Research*, as a spin-off of the OECD conference in Oct 2018.

## Economic report

### 7. Received grant from SNS for the reporting year (SEK):

450 000,00 SEK

### 8. Transfer of SNS funds to project partners

Country	Partner organization	Sum (SEK)
Denmark	University of Copenhagen	6634,16
Finland	Luke	242166,68
Finland	Luke (transfer to Siemen Forelia and Finn. Soc. For. Sciences)	126506,07
Sweden	Skogforsk	53075,00
Sweden	SLU	
Norway	Norwegian Institute of Bioeconomy Research	
Iceland	Skogreakt	82966,84
Other countries (specify)		
<b>Total SUM</b>		<b>511348,75</b>

### 9. Costs

	SNS funding	External funds*	Total*
Travel and hotel	133140,23		
Meeting costs	232769,65		
Consumables			
Salary	125587,23		
Communication	14544,14		
Other costs (national coordination)	5307,5		
<b>Total SUM (SEK)</b>	<b>511 348,75</b>	<b>68 046 976</b>	<b>68 558 324, 75</b>

\* If possible, provide details otherwise summarize the total sum for external funds and total.

#### Optional: Comments to the economic overview:

Exchange rate used 1 EUR = 10,615 SEK. This is the exchange rate for the received grant.


For external funds, data was available only for Sweden (Skogforsk), Denmark, and Finland. Data from Norway and Iceland is missing. For the same reason, details could not be provided.

In addition to the 450 000 SEK granted for the year 2019, savings from the previous years were used (61 348,75 SEK).

Annual report for SNS Centre of Advanced Research (CAR)

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

Main applicant's signature, place and date

  
.....  
(Tuija Aronen)

Natural Resources Institute Finland  
(Institution)

28.2.2020  
(Day / Month / Year)

Signature of the head of the main applicant's research institution

  
.....  
(Anu Kaukovirta, Vice President)

Natural Resources Institute Finland  
(Institution)

28.2.2020  
(Day / Month / Year)

Second applicant's signature, place and date

.....  
(Signature)

.....  
(Institution)

.....  
(Day / Month / Year)

Third applicant's signature, place and date

.....  
(Signature)

.....  
(Institution)

.....  
(Day / Month / Year)

Annual report for SNS Centre of Advanced Research (CAR)

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

Main applicant's signature, place and date

.....  
(Signature)

.....  
(Institution)

.....  
(Day / Month / Year)

Signature of the head of the main applicant's research institution

.....  
(Signature)

.....  
(Institution)

.....  
(Day / Month / Year)

.....  
(Printed name, function)

Second applicant's signature, place and date

*Lou R. Wise*

.....  
(Signature)

*University of Copenhagen*

.....  
(Institution)

*25/2-2020*

.....  
(Day / Month / Year)

Third applicant's signature, place and date

.....  
(Signature)

.....  
(Institution)

.....  
(Day / Month / Year)

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

Main applicant's signature, place and date

.....  
(Signature)

.....  
(Institution)

.....  
(Day / Month / Year)

Signature of the head of the main applicant's research institution

.....  
(Signature)

.....  
(Institution)

.....  
(Day / Month / Year)

.....  
(Printed name, function)

Second applicant's signature, place and date

*Torgny Persson*

.....  
(Signature)

.....Skogforsk.....  
(Institution)

26/02/2020...  
(Day / Month / Year)

Third applicant's signature, place and date

.....  
(Signature)

.....  
(Institution)

.....  
(Day / Month / Year)