

Final report of the project

“Granskötsel och ståndortsfaktorer som påverkar förnygring av ekplantor”

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First of all, I want to thank you for the financial support during my last year in Sweden, and my apologies for the delay. I left the country in September 2017. Most of the money was used to cover my salary (when my work was reduced to 50% part time in 2017) to write two popular-science articles and prepare one book chapter finished in 2018 based on the project work. All publications, in English and Swedish (if available) are attached to my email.

A smaller part of the money was used for a European scientific conference and excursion in June 2017 to Toennersjoeheden (experimental forest SLU) and Bjaernum (private forest owner). The silvicultural expertise by Dr. Franka Huth (TU Dresden), Dr. Andreas Moelder (north-western experimental forest station), Dr. Per Hazell (SKS), Dr. Ulf Johansson (SLU), Dr. Maciej Pach (University of Krakow) and Dr. Andrzej Bobiec (University of Rzeszów) was applied in practice, and summarized in the article “**Nya perspektiv på ekskogsskötsel**” in the popular forestry journal Ekbladet, No. 32 (see email pdf attachment). The article was also translated to English, and founded one part of the base to write the book chapter “**Regeneration Patterns in Mixed-Species Stands**” by Magnus Löf, Christian Ammer, Lluís Coll, Lars Drössler, Franka Huth, Palle Madsen and Sven Wagner in the book by A. Bravo-Oviedo et al. (eds.), Dynamics, Silviculture and Management of Mixed Forests, Managing Forest Ecosystems 31, https://doi.org/10.1007/978-3-319-91953-9_4.

The recorded data of regeneration dynamics in northern European long-term forest experiments containing multi-layered stands was used to analyze oak and spruce seedling development. A positive relationship between pine proportion and stand age with the occurrence of oak was found, but the data was limited to upscale deeper insights gained from MSc theses by Roman Balster and Joakim Frick (https://stud.epsilon.slu.se/7425/7/balster_r_141020.pdf, https://stud.epsilon.slu.se/8415/7/frick_j_150827.pdf), both based on one stand only. Also, younger conifer plantations with possible admixture of oak trees was not included in the experimental data. By the analysis of the available regeneration data, some shortcomings of natural regeneration research in Sweden during the last century was found and highlighted in another popular-science publication “**Introducing CCF into forest management and forest research in Sweden**” (attached to my email, both in Swedish and English).

In addition, the project budget allowed also consultations with public and private forest owners (Linköping, Goeteborg, Bjaernum), the location of pine-oak mixed forest stands adjacent to the corresponding monocultures, and participation in the conference “Restoring Forests: Regeneration and Ecosystem Function for the Future”.

Indirectly, by your support of this project, a joint Pan-European study of mixed oak-pine stands was initiated that also helped to established a European network of pine-oak triplets from Sweden to Georgia which may gain new insights into the promotion of oak trees in conifer forests under changing climate, with a first scientific article “**Stand growth and structure of mixed-species and monospecific stands of Scots pine (*Pinus sylvestris* L.) and oak (*Q. robur* L., *Quercus petraea* (Matt.) Liebl.) analysed along a productivity gradient through Europe**” published this year (<https://link.springer.com/article/10.1007/s10342-019-01233-v>).

Welcome to this part of the world they call the balcony of Europe! Do not hesitate to contact me.

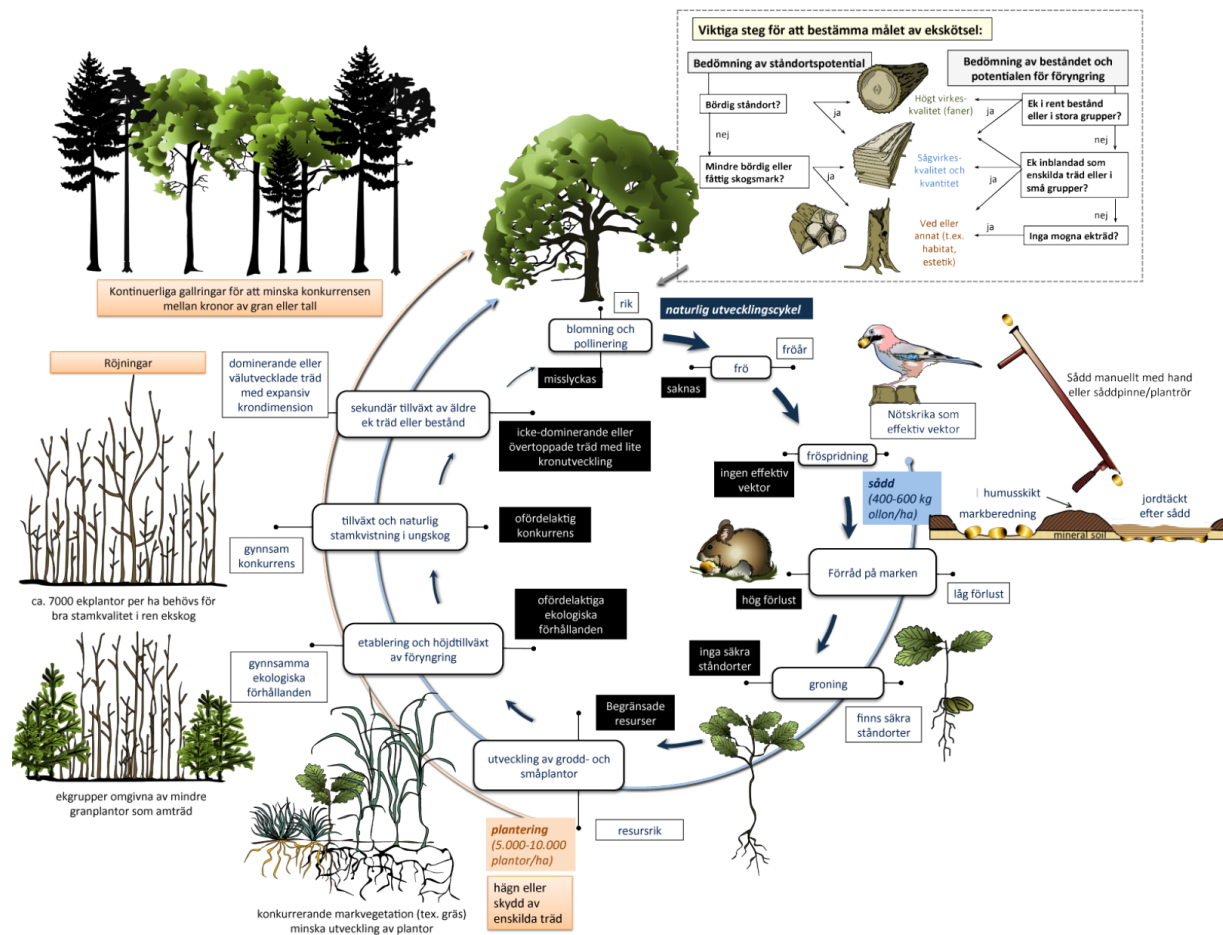
Short popular summary

“Granskötsel och ståndortsfaktorer som påverkar förnygring av ekplantor”

Ett bild saeger mer aen 1000 ord. Instead of a short popular summary, I recommend you to use the following link. The figure below is the most interesting part of our short and practice-oriented description of contemporary oak silviculture in Central Europe: <http://www.ekframjandet.se/wp/wp-content/uploads/2012/01/Ekbladet-32-hela-low.pdf>

You can use the main conclusion of the article as a short popular summary and provide the link:

Ekskötsel är intensivt och dyrt men givande på lång sikt. Plantering i grupper är inte billigare per hektar än konventionella planteringar, men ger större flexibilitet i bestånd där grupperna kan komplettera naturlig förnygring eller blandas med plantering av andra trädslag. Sådd är också arbetsintensiv, men det går att få hjälp av nötskrikan med förnygringen. Ett säkrare val är plantering, särskilt när andra konkurrenskraftiga trädslag redan finns på plats.



Figur 6. Ekologiska processer som kan vara ofördelaktiga (svarta boxar) eller gynnsamma för skogsägaren under särskilda skötsel mål och miljöförhållanden. Illustration Franka Huth.