

Milestone 19 – 2nd Stakeholder Workshop

Second Swedish Stakeholder Workshop: Workshop documentation

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1 Introduction

This report is a summary of the preparation and implementation of the second ALTERFOR stakeholder workshop in the Swedish Case Study Area (CSA), and thereby fulfills the requirements in work package 4 to document the stakeholder workshops (MS18 and MS19). The workshop, which was organized together with our non-academic partner Södra, took place at Södra's headquarter in Växjö the 3rd of October 2018. The workshop addressed wood production, and more specifically how the climate change mitigation capacity of the forests in the CSA can be increased by implementing measures to increase production.

2 Workshop preparation

2.1 Selection of a workshop topic

Södra is the non-academic partner of the ALTERFOR project in the Swedish case study and the most powerful actor in forest management within the CSA (Juerges et al., 2017). At the same time, the RIU-model, which constitutes the theoretical basis guiding the workshop preparation and implementation within the project, stress the importance of finding powerful allies to facilitate the implementation of science into practice (Böcher and Krott, 2017). Hence, after receiving the workshop guideline, which suggested a workshop divide between different forest functions and corresponding stakeholder interests, it was very easy to decide that one of the workshop would be organized together with Södra, and focus on wood production, which is the forest function that Södra find most important. The planning of the workshop started in early summer 2017, when we started to think about which specific topic(s) related to wood production that would be interesting to focus on. During this period we had some contact with Anders Ekstrand, and we scheduled a planning meeting at Södra's headquarter the 27th of October. The goal of the meeting would be to agree on a date and a workshop topic, as well as agreeing on a rough plan for the alternative landscape simulations that would be presented at the workshop. Some initial ideas were compiled into the Swedish workshop concept (Lodin, 2017) that was sent to the WP4 leaders and presented at the ALTERFOR meeting in Galway. At this stage, the specific details regarding the workshop were left open by purpose, issues that would be decided during the meeting with Södra.

The full-day meeting between the Swedish ALTERFOR researchers (Vilis Brukas, Ljusk-Ola Eriksson, Urban Nilsson and myself) and the representatives from Södra (Anders Ekstrand, Göran Örlander and Magnus Pettersson) took place according to the plan at Södra's headquarters the 27th of October. The day started with introductory presentations about the entire ALTERFOR project (by Vilis Brukas), followed by more detailed presentations about the work in the CSA with current and alternative landscape level simulations in the Swedish decision support system Heureka (by myself and Ljusk-Ola Eriksson). After lunch the meeting continued with discussions about potential topics for the stakeholder workshop. The meeting was very productive, and we were able to agree on two focus areas that would guide the preparation of the alternative landscape level simulations for the workshop:

Focus area 1: How much land is available for wood production?

This focus area would include analyses of results from simulations with different level of restrictions on wood production due to nature conservation. This is always a hot issue within the forest sector, where mandatory and voluntary (through certification) restrictions due to biodiversity conservation gradually have increased over the last decades. By comparing a simulation with the current level of nature conservation with a simulation with basically no conservation at all (only formally protected areas would be exempted from final felling), Södra was interested in showing the opportunity cost of the current conservation measures i.e. the harvest opportunities that are lost by the private forest owners in the county without any financial compensation. In addition, Södra were interested in looking into the consequences of further increases in set-asides or other restrictions, and during the meeting they suggested that + 100 % as a potential level to implement in the simulations.

Focus area 2: How intensively should we manage the forest?

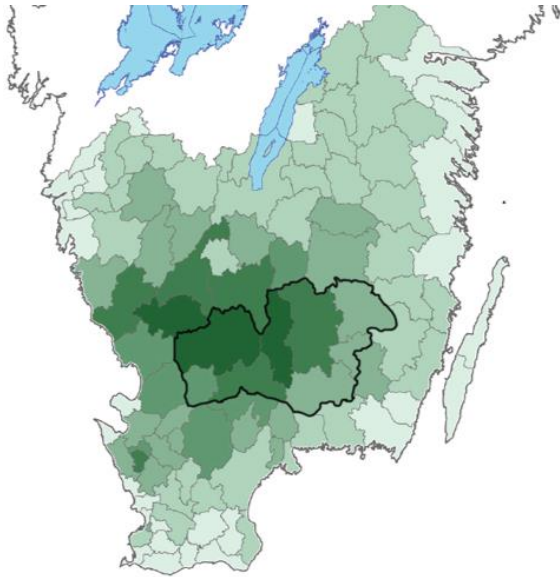
This focus area would compare simulations where the share of the forest managed for wood production would be kept constant, but the management intensity would vary. Also here Södra expressed a will to look into the benefits of what already is done today, and therefore often is taken for granted. In this case, the benefits of the current investments in silviculture would be exposed by comparing a simulation with current FMMs with a simulation with forest exploitation, where the forest would be harvested without any investment in regeneration and precommercial thinning (PCT). The second area of interest was to investigate the potential to increase the future harvest level with better and more intensive management.

During the meeting the representatives from Södra expressed that they would not decide all the details, i.e. we had a great freedom to freely structure these two focus areas into interesting alternative landscape level simulations to present at the workshop. And accordingly, after this meeting where the overarching focus areas were defined, Södra was little involved in more detailed issues related to the simulations (with some exceptions, see 2.2). After the meeting not much work was done until May 2018, when the other stakeholder workshop (with focus on green infrastructure) had been finalized.

When comparing the initial plan, defined at the meeting, with the final result, it is evident that the workshop focused a lot on focus area 2, and more specifically on how we can increase the future harvest level with more intensive forest management. Focus area 1 was also addressed at the workshop but more briefly. It was mainly used to define and give an introduction to the main problem/challenge, which was that the forest resources are not sufficient to fulfill both climate change mitigation and a high ambition in biodiversity conservation (see 3.2.3). A problem which would be addressed by measures to increase production. The strong focus on focus area 2 can partly be explained by the fact that there are many different options to increase growth, and we therefore had to devote a lot of time to present different alternatives. In addition, production oriented measures are discussed in an ongoing policy process that aims to define action areas for increased production on national level (SFA, 2018). By focusing strongly on production oriented measures we wanted to provide results that could be interesting for forestry actors involved in this process.

2.2 Deciding on the landscape level simulations

The simulations that were presented at the workshop were conducted in Swedish CSA Kronoberg County (Picture 1), a rather typical forest landscape in southern Sweden, dominated by the native conifer tree species (especially spruce) and by small-scale private forest ownership.



Picture 1. Picture showing the location of the Swedish CSA Kronoberg County in southern Sweden (the area within the bold black line). The picture also shows the damages inflicted by the Gudrun storm in 2005 (darker green=more damages), that caused massive damages in southern Sweden and especially in Kronoberg.

All simulations were conducted within the frames of the IIASA scenario GLOBAL BIOENERGY, the most ambitious climate change mitigation scenario in ALTERFOR (Figure 1). This future implies an 68 % increase in total annual harvest (compared to the current harvest in the CSA) and 1,5 degrees increase in global temperature (compared with the pre-industrial level) in 2110. This scenario is thereby characterized by a much higher increase in demand (REFERENCE + 24 %/16 % EU BIOENERGY in 2110), and a lower warming (REFERENCE + 3,7 degrees/EU BIOENERGY +2,5 degrees in 2110) than the two other IIASA scenarios. This scenario was chosen since it projects a future very beneficial for Södra, and other industrial forestry actors. This future implies the implementation of very ambitious efforts to mitigate climate change, basically a total transformation of the society, where the forest sector is expanding at the expense of other sectors that generate a bigger carbon footprint. I (Isak Lodin) was the one that suggested that we should use this scenario in the simulations for the workshop, and Anders Ekstrand accepted my proposal with no objections.

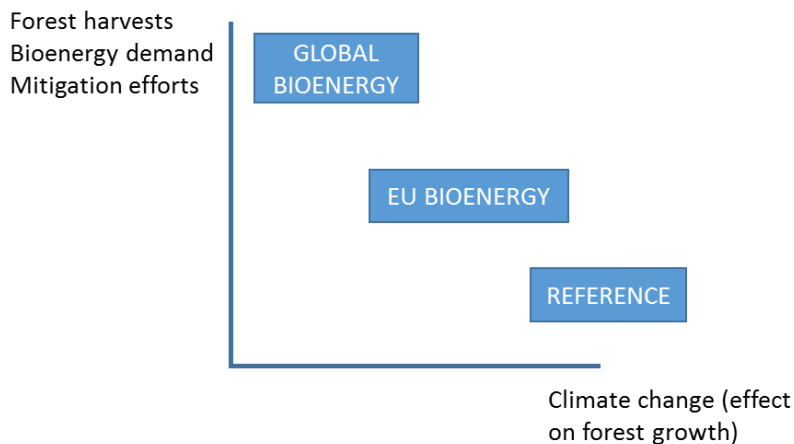


Figure 1. Top-down scenarios in ALTERFOR with respect to the climate mitigation efforts and the climate change.

Following is a description on how the two focus areas defined at the meeting with Södra and the IIASA scenario GLOBAL BIOENERGY were combined into alternative landscape level simulations for the stakeholder workshop.

The GLOBAL BIOENERGY scenario implies a massive increase in harvest, at the same time as there is relatively little increase in growth due to climate change. The landscape level simulations with current FMMS, that were conducted to fulfill D.3.2 *“Synthesis report: discrepancies between ES needs and ES outputs under current FMMS”*, clearly showed that this challenge cannot be achieved with the current way of managing the forest in the CSA. To satisfy the demand, the growth available for harvest needs to increase considerably. The total growth that is available for harvest can be modified in two ways: i) by changing the share of the forestland that is available for wood production (focus area 1); or ii) by changing the forest management intensity on the forest area managed for wood production (focus area 2).

The first focus area was addressed by comparing forest management with current FMMS with the simulations “No conservation” and “the FSC proposal” (Table 2). The “No conservation” simulation was exactly in line with what had been decided during the meeting with Södra. The “FSC proposal” simulation was made as a response to Södra’s interest in looking at the consequences of increased nature conservation requirements. More specifically it looked at the consequences of implementing the proposal on a new Swedish FSC (Forest stewardship council) standard in practice. This will imply requirements on increasing the share of set-asides or implementing continuous cover forestry (CCF) (Table 1). This simulation would thereby provide the forestry actors with relevant information, showing the consequences of a proposal that likely will be adopted in the near future. At the same time, this was an opportunity for us to implement our aFMM “the selection system” (Table 1) into an alternative landscape simulation, and consequently maintain it as an aFMM in ALTERFOR. Because the County Administrative Board had not been interested in this aFMM for the first stakeholder workshop (see milestone 18). We briefed Anders about our idea with the “FSC proposal” simulation and he had no objections.

Table 1: Stand level changes implemented in the alternative landscape level simulations for the second stakeholder workshop.

The selection system
Description: Continuous cover forestry (CCF) through the selection system, which involves repeated selection fellings of the largest trees every 20 years.
Motivation: The selection system is one of the four aFMMs developed in the Swedish case study. The purpose of incorporating the selection system into a simulation for the workshop was to show the consequences of the proposed new Swedish FSC standard on the possibility to increase the future harvest level. The proposal on a new Swedish FSC standard includes requirements on + 5 % set-asides or + 5 % management with increased consideration (where CCF is one of the potential options).
Improved regeneration and PCT
Description: Replacing failed regeneration (low stocking, a lot of birch), natural regeneration on moist sites (Norway spruce mixed with birch), and seed tree regeneration of Scots pine with establishment of genetically improved planted seedlings of Scots pine and Norway spruce. Conifer oriented PCTs are conducted in all young stands "in need" of PCT (increase from approx. 75 % PCT in the simulations with current FMMs, in the simulations with current FMMs there was also a small share of PCTs promoting broadleaves).
Motivation: Among the existing well-known regeneration methods, planting of genetically improved seedlings of Scots pine and Norway spruce give the highest growth on most sites throughout a full rotation. PCT is a very important silviculture treatment, which substantially increase the revenue in subsequent commercial thinning operations by increasing the diameter of the harvested trees.
More pine
Description: Increasing the share of Scots pine in regeneration from 50 % to 100 % on low fertility sites (site index \leq SI 26). This is coupled with a corresponding decrease in the share of Norway spruce on these sites from 50 % to 0 %.
Motivation: With the current reforestation practices much of the Scots pine forests in the CSA will be replaced by Norway spruce (since owners don't dare to plant pine due to the high level of damages from browsers). This is problematic for biodiversity conservation, but also for wood production since Scots pine is an important commercial species. The performance of Norway spruce on low fertility sites is also uncertain and the current wide-scale use on such sites is risky. This is an issue of great concern for policymakers and practitioners.
Hybrid larch
Description: Planting at a normal spacing and a standard PCT program followed by frequent commercial thinnings. The rotation period is 40-50 years. Hybrid larch is mainly replacing monoculture plantations with Norway spruce in the simulations.
Motivation: Recent studies have showed that Hybrid larch has a substantially higher production than Norway spruce on the same sites in southern Sweden (approx. + 30%). Hybrid larch also has a shorter rotation period than Norway spruce. Hence, with Hybrid larch you will produce more wood, and the shorter rotation period implies that it can be used strategically to bridge future wood shortages.
Intensive conventional fertilization
Description: Conventional fertilization (150 kg N/ha) every 10 year in all Scots pine forests (>65 % volume pine) above 16 m in height.
Motivation: It is often highly profitable to fertilize 10 years before the final felling (10-15 % return on investment), but you can fertilize even more if the goal is to maximize production. This program is based on results from fertilization trials in southern Sweden, which showed that repeated fertilization give a good growth response on Scots pine, but no growth response on Norway spruce.
Clones of Norway spruce
Description: Reforestation with Norway spruce seedlings mass-produced through somatic embryogenesis. The same silvicultural program as for standard Norway spruce. In the simulations this program is mainly replacing monoculture plantations with normal Norway spruce seedlings.

Motivation: By mass-producing the best Norway spruces in the Swedish breeding program through somatic embryogenesis it is possible to exploit already made advances a bit earlier i.e. get the seedlings that will be available through conventional techniques within a few decades already today. Compared to normal genetically improved seedlings the clones have 15 % higher production.

The second focus area was addressed by comparing a landscape level simulation with current FMMS with alternative landscape level simulations where measures to increase production (improved regeneration and PCT, hybrid larch, intensive conventional fertilization, clones of Norway spruce, more pine) had been implemented to satisfy the increasing demand in the GLOBAL BIOENERGY scenario (Table 1-2). This was in line with Södra's wish to investigate the potential of increasing future harvest opportunities by intensifying forest management. Different strategies to increase production had been discussed briefly during the meeting with Södra, but the ALTERFOR researchers working with the simulations (myself and Ljusk-Ola Eriksson) were deciding freely what alternatives we should focus on. There was however one exception. Hybrid aspen and populus are highly productive on agricultural land. We were therefore thinking about investigating the potential of increasing wood production by afforesting abandoned agriculture land in the CSA with these two species. However, when we asked Anders he answered that Södra were not interested in investigating afforestation on agricultural land as an alternative at the workshop (and referred to it as a sensitive issue, maybe due to the connection between Södra and LRF, a lobby group for both farmers and forest owners). Finally, Södra's wish to show the benefits with the current level of investment in silviculture was not addressed in any simulation presented at the workshop. Simulating forest exploitation with no regeneration efforts in the DSS Heureka would give very uncertain results. Since it was a challenge to finalize all the other simulations in time for the workshop we decided to exclude this simulation.

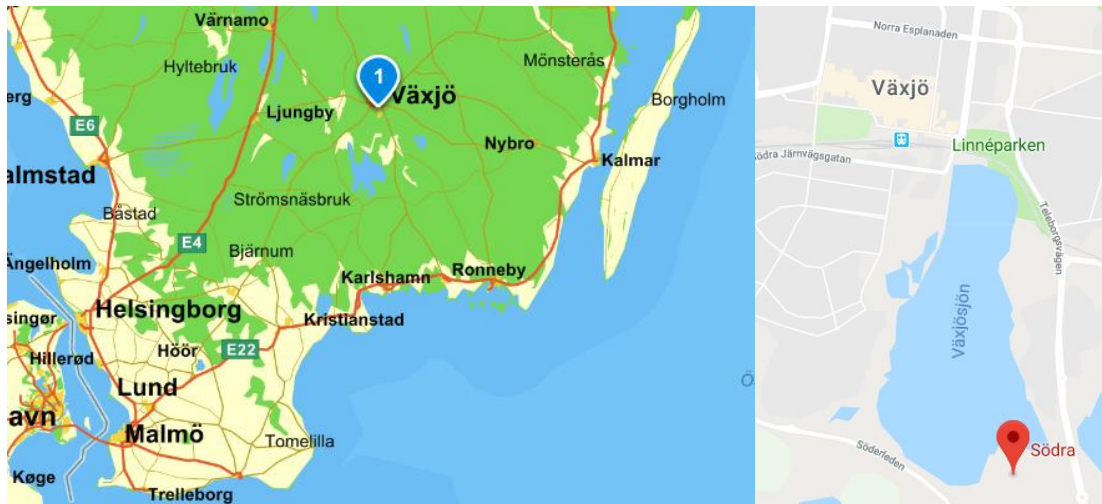
Table 2. Landscape level simulations presented at the second stakeholder workshop.

Forest management with current FMMs
Description: The same settings as the simulations with current FMMs for the entire CSA that were conducted to fulfill D3.2.
The FSC proposal
Description: 5 % of the CSA area is transformed from even aged management to CCF through the selection system according to the description in Table 1. Otherwise the same settings as forest management with current FMMs.
No conservation
Description: All forest except formally protected areas are managed with the production forestry settings from the simulation with current FMMs. This implies a reduction of the total area designated for conservation purposes from approx. 16 % to 2 %.
Improved regeneration and PCT
Description: Implementation according to the description in table 1. Otherwise the same settings as forest management with current FMMs.
Improved regeneration and PCT + More pine
Description: Implementation according to the descriptions in table 1. Otherwise the same settings as forest management with current FMMs.
Hybrid larch
Description: Reforestation with Hybrid larch on 25 % of the reforestation areas with mesic soils and SI \geq 28. Otherwise the same settings as forest management with current FMMs.
Intensive conventional fertilization
Description: Implementation according to the description in table 1. Otherwise the same settings as forest management with current FMMs.
Clones of Norway spruce
Description: Reforestation with clones of Norway spruce on mesic-moist sites with SI $>$ 26 according to the current legislation (max 5 % on property level, but always allowed to plant \leq 20 ha on each property). However, we did not have complete info regarding the forest ownership to individual properties in the CSA. This implies that the area established in the simulation most likely was slightly higher than the maximum legal area. Otherwise the same settings as forest management with current FMMs.
Combination for maximum production
Description: Combining “Improved regeneration and PCT + More pine”, “Hybrid larch”, “intensive conventional fertilization” and “clones of Norway spruce” into a simulation for maximum production.

2.3 Selecting dates and location of the Workshop

At the planning meeting on the 27th of October 2017 we agreed upon a few dates during the first week of October 2018 that worked for all the participants. These dates were within the timeframe defined in the workshop guideline, at the same time they didn't collide with any other major events, such as the moose hunting week the second week of October, where a lot of foresters normally participate. The final date was decided in the months following the meeting. Södra have excellent facilities for organizing workshops and other activities at their headquarters, which is situated in Kronobergs residential town of Växjö. The location of the workshop was therefore clear already from the beginning, and the workshop was consequently organized at Södra's headquarter in Växjö the 3rd of October 2018 (Picture 2). The location and place of the workshop must be regarded as a very good choice. It is natural that a workshop addressing forest management issues in Kronoberg County is organized in the residential town. Växjö has good communications, which made it easy for participants that arrived with train. Södra's headquarter was very well equipped for the

purpose, an auditorium for the presentations, smaller rooms for the group work and a restaurant for lunch/fika in the house.



Picture 2. Maps showing the workshop location in southern Sweden (left) and in the city of Växjö (right).

2.4 Selection and invitation of Stakeholders to the workshop

The idea from the beginning was to only invite stakeholders working with forest management to the wood production workshop with Södra (see Lodin et al., 2017), and if I remember correctly the representatives from Södra were positive to this approach during our planning meeting the 27th of October. This idea was in line the stakeholder workshop guideline, which provided some suggestions on “productive distinctions” between the two different workshops, one being to organize different workshops for different advocacy coalitions. However, in the end this idea was not followed through, mainly due to a quite random factor, that I didn’t have this plan fresh in my memory all the time. Because late during the first stakeholder workshop Anders Ekstrand from Södra, which had to leave a bit earlier, suggested that I should take the opportunity to invite all the participants (a mixed group with diverging interests) to the second stakeholder at the end of the day, which I also did. As a consequence, it was natural to use the same mail list as Mårten from the County Administrative Board used when inviting stakeholders to the first workshop also for the second one. In addition to these contacts, Anders added some names from Södra, and I added some names from forest management stakeholders that not been invited to the first workshop. Anders sent the invitation e-mail with a workshop program attached (Appendix 1) to 58 persons from the following stakeholders (Table 3) the 14th of August. In addition, a reminder was sent out by Anders the 25th of September, approximately one week before the workshop would take place. All the registrations, as well as practicalities related to food preferences, were handled by Anders.

The initial plan to invite a homogenous group of stakeholders was thus abandoned. This was however not a problem, it was made based on a suggestion from on non-academic partner Södra. During the workshop evaluation several of the participants also stressed that there was a lack of diversity (see 3.2.6), a critique that probably would had been more severe if we not even would have tried get stakeholders with other interests than wood production to come.

Table 3. Organizations and some individual persons invited to the 2nd stakeholder workshop.

Organisation	Description
Swedish Forest Agency	The governmental agency in charge of implementing national forest policy.
County Administrative Board Kronoberg County	Governmental agency working with nature conservation issues such as creation/management of protected areas and green infrastructure. Partner in organizing the first ALTERFOR stakeholder workshop in the Swedish case study area.
Södra (forestry staff)	Forest owners association in southern Sweden. Non-academic partner of ALTERFOR.
Södra (elected members from the forest management districts)	Södra is a democratic membership organization where each of the 36 forest management districts elects representatives to represent the members' financial and policy interests.
Sydved	Wood purchasing company in southern Sweden owned by the industrial forest companies Stora Enso and Ahlström-Munksjö
Skogssällskapet	Foundation working with forest management for different types of owners.
Växjö Parish, the Swedish church	Owns 48,000 ha productive forest land.
Vida skog AB	A major sawmill company in the CSA.
LRF (The Federation of Swedish Farmers)	Lobby group for Swedish forest owners and farmers.
ATA	A major sawmill company in the CSA.
Såg i Syd	Lobby group for small sawmill companies in southern Sweden.
Sveaskog	The state forest company. 58,900 ha productive forestland in the CSA.
Bergs Timber	Sawmill company
JGA	Sawmill company
Per Petersson	Independent nature consultant.
Ander Lundholm	ALTERFOR/University Colleague Dublin Invited since he currently lives in Sweden.

2.5 Deciding on a workshop program

As already described, not much work was invested into the preparation of the second stakeholder workshop during the period November 2017- April 2018. The work with the alternative landscape simulations and the preparation of the second stakeholder workshop program started in May 2018, when the first stakeholder workshop been finalised. We were quite satisfied with the outcome of the first workshop and therefore suggested a similar program for the second one. The program before lunch would include more general presentations (from Södra), followed by presentation of simulation results by myself. The afternoon would be devoted to group work followed by a presentation and discussion of the group work results in full group. In the beginning of June, prior to the meeting in Porto, I sent a draft of the program together with a short introductory text describing the topic and purpose of the workshop to Anders Ekstrand for review. The representatives from Södra

seemed to like our proposal and had no major objections. In the program that was sent out with the invitation (Appendix 1), the workshop was titled *“Is the forest of Småland sufficient for everybody’s needs?”* (Räcker Smålands skogar till alla?). In the subsequent text that described the workshop agenda we already indicated the answer. The forest resource would not be sufficient for meeting important climate change mitigation targets if the current practices remained intact. Consequently, there was a need to implement measures targeted towards increasing production and future harvest opportunities. In line with Södra’s interest in increased production, as well as the challenge facing the forest sector in the future envisioned in the GLOBAL BIOENERGY scenario, the invitation to the workshop thus conveyed a strongly production-oriented message.

During the last months before the workshop I worked hard together with Ljusk-Ola Eriksson to finalize all the landscape level simulations that should be presented at the workshop. Anders Ekstrand was responsible to book interesting speakers from Södra that would talk during the first hour. Compared to the program attached to the invitation letter (Appendix 1) there were some smaller changes made in the speakers from Södra (Henrik Brodin and Göran Örlander was replaced by Henric Dernegård). Approximately one week before the workshop I prepared five themes with questions for the group work and sent them to Anders Ekstrand, Vilis Brukas, Ljusk-Ola Eriksson and Urban Nilsson for feedback. They liked my suggested themes and questions, and only very small modifications were made. Finally, the last day before the workshop I created groups for the group work based on a list of participants that I received from Anders.

3. Workshop implementation

3.1 Participants in the Workshop

In total 16 persons participated in the second stakeholder workshop (Table 4). Considering that 58 persons were invited to the workshop this must be regarded as a poor outcome. In addition, 11 out of the 16 participants were from SLU and Södra. Hence, the outcome was also poor in terms of the diversity of participating organizations, with no participants from nine of invited organization listed in Table 3. There are some evident and other possible factors that can explain the poor outcome. Firstly, four persons that had signed up for the workshop did not show up (one person from LRF, one person from the Swedish Forest Agency, one person from Växjö parish, one person from the Swedish Society of Nature Conservation). Secondly, the invitation was only made over e-mail. It is likely that some more participants would sign up if I (or Anders) would have called persons that not signed up in and tried to “sell” the importance of the workshop a bit more. Finally, maybe the strong production orientation of the workshop made actors like the County Administrative Board (who mainly work with nature conservation issues) less interested in participating. The lack of participation from the CAB Kronoberg is arguably the biggest failure, considering that we organized the first stakeholder workshop together. I would most likely been able to persuade at least one person from the CAB to join (we invited five persons from the CAB in the e-mail) if I would have contacted them over phone. It is a pity that I did not do this. Finally, also for this workshop the person that participated were not always the same persons that were invited in the e-mails. This can be explained by internal communication

within the participating organizations.

Table 4. Participants in the 2nd stakeholder workshop

Name	Organisation
Jan Lannér	Swedish Forest Agency/Helgeå model forest
Hasse Bengtsson	Swedish Forest Agency
Per Petersson	Nature conservation consultant
Henric Dernegård	Södra (energy)
Magnus Pettersson	Södra (forest management)
Tomas Rahm	Södra (nature conservation)
Malin Petersson	Södra (cooperation)
Anders Ekstrand	Södra/ALTERFOR
Eric Agestam	SLU/ALTERFOR
Urban Nilsson	SLU/ALTERFOR
Vilis Brukas	SLU/ALTERFOR
Isak Lodin	SLU/ALTERFOR
Pär Fornling	SLU
Ljusk-Ola Eriksson	SLU/ALTERFOR
Thomas Höijer	Sydved
Mattias Magnusson	Växjö Parish, the Swedish church

3.2 The program

3.2.1 9:00-9:15, Welcome by Magnus Pettersson, Södra

The stakeholder workshop started with a short round of presentation of all the participants. Magnus Pettersson greeted everybody welcome. By stressing the importance of collaboration between practical forestry and research, as well as between forest owner associations and authorities, he tried to highlight the importance of the event.

3.2.2 9:15-10:00, Presentations by Tomas Rahm and Henric Dernegård, Södra

Sustainable forest management from Södra's perspective by Tomas

Tomas Rahm is working with issues related to sustainability and nature conservation at Södra. In his presentation Tomas provided information about the typical estate of a Södra member, as well as information about the sustainable harvest level on such an estate. The members of Södra control approximately half of privately owned forest in southern Sweden. Knowledge regarding these basic facts is therefore crucial when discussing the possibilities to increase future harvest opportunities. Following is a list of key points from Tomas presentation:

- The estate of the typical member has the following distribution: unproductive forestland (< 1/m³/ha/year)(6,9 % of all forestland), productive forestland (> 1/m³/ha/year)(93,1 % of all forestland), formal protection (3 % of the productive forestland), voluntary protection (8,1 % of the productive forestland), stand with

combined goals (i.e. less wood production than normal)(2,5 % of the productive forestland), the general consideration at final felling constitutes 5 % of the area that is managed for wood production. The remaining production area constitutes 76 % of all forestland, or 82 % of all productive forestland.

- Södra has in collaboration with SLU calculated a sustainable harvest level, the methodology is the same as the one used in SKA 2015 (the most recent impact analysis of the current forest management practices that been conducted in Sweden). According to this calculation the sustainable harvest level is 6,5 m³/ha/year, with +- 10 % as the higher/lower sustainable level. This correspond to 6-7 m³/ha/year. The three year average has been 5-6 m³/ha/year during most of the last decade. But within the interval during the last 3-year period. This implies that the harvest potential more or less is fully utilized today. The only way to increase the harvest in a sustainable way is to increase the growth.
- Nature conservation oriented management measures in NS (nature conservation with management) stands could be conducted on 3000 hectares annually. This goal has only been achieved 2012 and 2013, which can be explained by the fact that subsidies for such measures were available these two years. Less than half (1.452 ha) was conducted last year. One complicating factor is the seasonal ban on harvesting in such stands in the certification.
- The share of final felling's with good or very good consideration has increased considerable in Södras internal controls since 2010. The main reason is a change in mentality, it is no longer considered cool to make deep tracks in the ground with the machine.
- Södra has a goal to increase growth with 20 % until 2050, thereby contributing to climate change mitigation.

A concept for biorefineries in the forest sector for future energy solutions by Henrik

Henric Dernegård had a presentation about challenges associated with replacing the fossil fuels in the Swedish energy system with renewable resources, such as biofuels from wood. In the presentation Henrik provided quantitative figures showing how much biofuels that would be needed for this transformation, as well as how biofuels from wood could be produced in the most cost effective way. In regards to the challenge of mitigating climate change, Henrics presentation focusing on challenges related to demand acted as a good complement to Tomas presentation, which focused more on the supply side of the equation (i.e. harvest potential among private forest owners). Following is a list off key points from Henrics presentation:

- The biggest problem in the Swedish wood and energy system is to reduce the use of fossil fuels. Transportation is the biggest contributor to emissions. Industry that relies on fossil fuels have largely moved to other countries. But it is not possible to move transports that use fossil fuels. There is a need to make transports more effective, to replace fossil fuels with electricity and to substitute fossil fuels with biofuels.
- The use of concrete continues to increase. No reason to believe that the use of concrete will go down, wood is much more expensive. 50 % of all houses in Sweden are multiple-floor residential buildings, > 90 % of them are built in concrete.
- Biofuels are extracted to a large extent in final felling's in southern Sweden, but seldom in northern Sweden. This is a result of the long distances in the north, it is not

- profitable to transport biofuels longer than 100 km.
- The total need of biomass will be 50-60 TWh in 2045. This demand will be hard to satisfy and will require a big increase in the growth of the forest.
- When timber and pulpwood are used in the industry you get residues that are used as biofuels. To meet the increased demand of biofuels we therefore need to produce more timber and/or pulpwood. Since the production of timber is much more profitable we need to continue with the current silvicultural programs (i.e. more of the same).

3.2.3 10:15-12:00, Results from simulations in Heureka by Isak Lodin, SLU

After a short fika break the workshop continued with my presentation that was titled: *“Alternatives to increase wood production- results from simulations in Heureka in Kronoberg County (Handlingsalternativ för att öka skogsproduktionen – Resultat från Heurekasimuleringar i Kronobergs län)”*. The presentation was divided into three parts, following is an overview of the presentation.

Part 1

Short introduction to the ALTERFOR project (aim, methods, desired results, participating countries).

Part 2

This part was devoted to answer the question “Is the forest of Småland sufficient for everybody’s needs?” with results from landscape level simulations in Heureka. The answer to this question is no. In a future with very ambitious climate change mitigation efforts (i.e. GLOBAL BIOENERGY) the simulations showed that we will not be able to satisfy the demand with current FMMs and current level of nature conservation. By highlighting the need for measures to increase production I thereby defined the problem that would be addressed in the alternative landscape simulations in part 3. To support my conclusion and the problem formulation the following things were presented:

- The three different scenarios used in ALTERFOR. The future they project in terms of increased demand and climate warming.
- How much that is harvested today in southern Sweden, how much that is harvested in relation to what is available for harvest. In line with the figures provided by Tomas Rahm, also my investigations showed that the short-term possibility to increase the wood harvest in a sustainable way is very limited.
- The settings for the landscape level simulation with cFMMs.
- Simulation results from the landscape level simulations with cFMMs in the three different scenarios, showing that we cannot meet the projected increase in demand in GLOBAL BIOENERGY with current practices.
- Simulation results showing the goal conflict between biodiversity conservation and climate change mitigation. In the “No conservation” simulation you can satisfy the harvest level in the GLOBAL BIOENERGY scenario during all periods, but the harvest exceeds the growth in the production forest at the end of the simulation. Implementing the new FSC proposal, with requirements on more-set asides or CCF, will reduce growth and future harvest opportunities. This will make the goal conflict between conservation and climate change mitigation even more pronounced.

- Consequently, it is not possible to reach the harvest level in GLOBAL BIOENERGY with current FMMS and the current, and future expected, conservation requirements substantially reduce future harvest possibilities. This goal conflict can be addressed by increasing growth on the areas that are managed for wood production.

Part 3

The last part was devoted to presenting examples of potential solutions to the problem presented in part 2 (i.e. how we can increase growth and satisfy the demand in the GLOBAL BIOENERGY within the frames of the current level of nature conservation by implementing measures to increase production). This involved presenting the following things:

- A short introduction to measures for increased production, where I classified them into different types (more of the same, small modifications within the frames of what we do today, implementation of things that are totally new or very uncommon) and discussed that different measures gives results on different time frames. Here I also referred to the fact that several of our production oriented measures were included in the report “Measures to increase production” (Produktionshöjande åtgärder) (SFA, 2018). This is a report that been written during the ongoing work with concretizing the production goal in the Forestry act into action areas for increased production. By doing so I was trying to highlight the relevance and importance of our simulations results.
- The motivations behind implementing the different production oriented measures, how the different measures had been implemented in the alternative landscape level simulations, barriers and opportunities related to the wide-scale implementation of the different measures.
- Results from the alternative landscape level simulations where the production oriented measures had been implemented. The results were visualized in line with the example provided in Fig 2. All the production oriented measures resulted in a considerable increase in growth and harvest, where “better regeneration and PCT” and “clones of Norway spruce” had the biggest positive effects. However, as can be seen in Fig 2 none of the production oriented measures could alone increase the growth sufficiently to meet the projected demand in the GLOBAL BIOENERGY scenario.
- The “combination for maximum production” simulation fulfilled the demand in the GLOBAL BIOENERGY scenario and the harvest never exceeded the growth in the forest managed for wood production. In total this alternative landscape simulation increased growth during the simulation period with 29 % compared to the landscape level simulation with cFMMS.

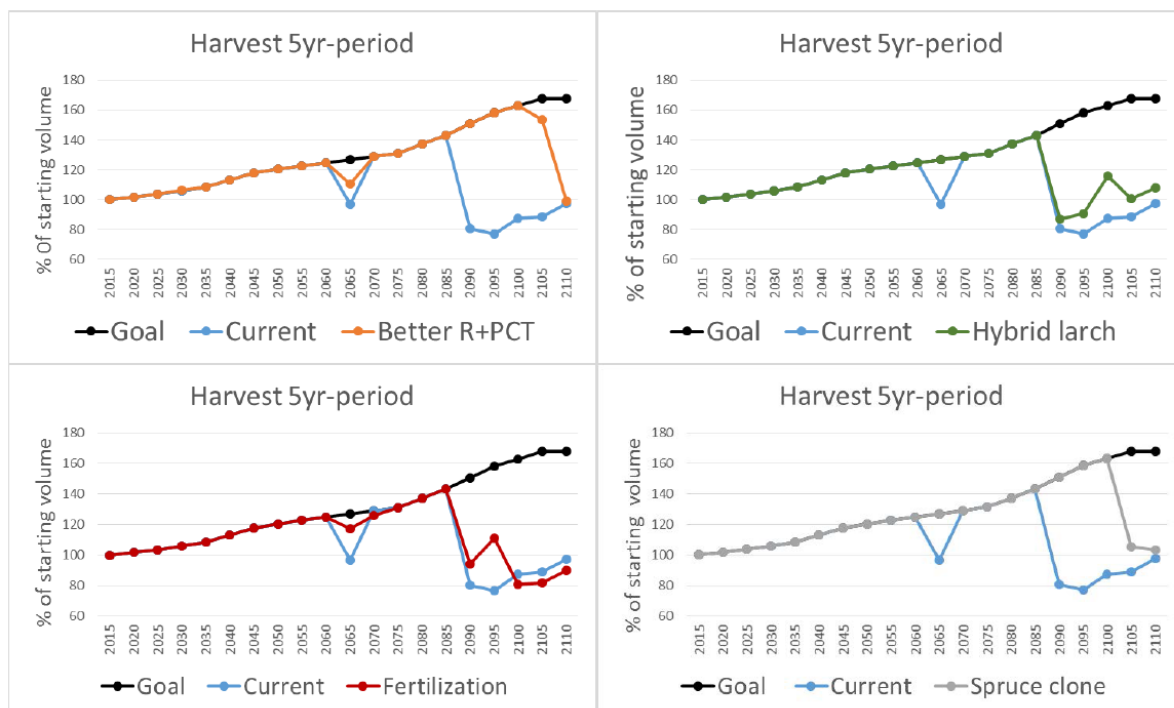


Figure 2. Example of how the results from the alternative simulations were presented at the stakeholder workshop. The total harvest in each period is related to the total harvest in the first period, which is the same in all simulations. The black line show the demand in the IASA scenario GLOBAL BIOENERGY. The blue line the total harvest in the landscape level simulation with cFMMs. The orange, red, green and gray line show the total harvest in the alternative landscape level simulation where measures to increase production have been implemented. The periods where the harvest level in GLOBAL BIOENERGY been satisfied you cannot see the black line. The periods where the harvest in the alternative landscape level simulations is the same as the landscape simulation with cFMMs you cannot see the blue line.

3.2.4 13:00-15:40 Group work

After a one hour lunch at the restaurant in the house, a long session was devoted to group work, which had been prepared and was chaired by myself. I had created groups beforehand based on a list of participants that I received from Anders Ekstrand a few days before the workshop. My intention had been to create diverse groups (different organizations represented), while at the same time assure that each theme had at least one group member with expert knowledge. However, a few persons never showed up to the workshop, a few persons could only participate before lunch (Tomas Rahm, Henric Dernegård) and some participants had not signed up in advance. Due to this I had to create new groups on spot, and in addition, some of the groups decided to merge due to small group sizes. In the end the group work had three instead of five groups. These changes were inevitable and unproblematic, the groups were still quite diverse (as diverse as they could be considering the dominance of participants from Södra and SLU) with key expertise dispersed in a good way. After a short introduction to the task by myself, each group worked individually in smaller rooms with their theme for about one and a half hour. After this all participants gathered and reported the results of their group work and the questions related to each theme were discussed further in the big group.

Following is a presentation of the five themes and underlying questions, and short summary of the reported answers and the subsequent discussion. The workshop secretary (Vilis

Brukas) did only take part in the group work presentations in the full group, not in all groups' individual work. The summary should therefore be seen as an overview, not covering the discussions in detail. It is also evident that the discussion did not always stick to the questions formulated under each theme, this can be expected from discussions where the addressed issues is highly interlinked. I took part in a group that was responsible for theme 2 and 3. In this group there were participants with quite strong opinions regarding current problems with biodiversity conservation in the forest sector (Per Petersson, and also to some extent Jan Lanner). This made it quite difficult to constructively discuss how we can increase production (for example theme 3). If you think that the current practices already are very bad from a biodiversity perspective it is not surprising that you are reluctant to discuss further intensification (also see the comment by Malin Petersson in 3.2.6, she was a member in my group).



Picture 3. One of the groups engaged in discussions during the group work in the second stakeholder workshop. Urban Nilsson (front left), Magnus Petersson (top left), Vilis Brukas (middle), Hasse Bengtsson (right)

Theme 1. Balance the different values provided by forests, do we want to significantly increase production?

In an international perspective Sweden is characterized by intensive forestry, and in a short-term perspective the possibility to increase the sustainable harvest level is limited. Additional intensification might therefore negatively influence other important forest values (e.g. biodiversity, aesthetical values) at the same time as the marginal costs for further increasing growth probably is higher here than in other parts of the world. Against this background, is it reasonable to invest so much resources to increase growth here in Sweden? Or is it more effective to invest the resources somewhere else? How can you compensate for potential negative effects of measures to increase production?

I (Isak Lodin, SLU) reported

The discussion mainly circled around if it is such a good idea to further increase production. A little bit different opinions within the group. It is important to clarify which negative consequences the different measures can have. Here it is important use the knowledge that

already exists, but also to conduct more research. For example: how smart is it to clear ditches? If you increase production a lot the landscape will be more segregated (i.e. between production forest and set-asides), is this good? The value of general consideration might be overestimated, you retain trees after harvest and then they blow down.

Theme 2. Discussion about the measures

During the day we have presented different measures to increase production (better regeneration and PCT, hybrid larch, clones of Norway spruce, fertilization in forests of Scots pine) that aims to respond to a massive increase in demand in an ambitious climate change mitigation scenario. What do you think about the suggested measures with regard to their effect, cost, and feasibility? Which of the measures are most/least realistic to implement in practice? Are there any measures to increase production that you think are missing? Why do you think these measures are suitable?

Thomas Höijer (Sydved) and Eric Agestam (SLU) reported

Thomas Höijer: Hybrid larch is the best alternative, because you see the result very quickly since it grows so fast. One problem with investment in measures to increase production is that the owner do not see (or understand) the effect in the future, but need to accept the cost of the measures today. Feasibility, better regeneration and PCT are the easiest alternatives to implement. But help from the authorities is needed, stronger and more active advisory services from neutral advisors (the Swedish Forest Agency). The high populations of ungulates have a very negative effect on growth, something need to be done and the Swedish Forest Agency needs to take a clear standpoint in this issue.

Eric Agestam: Maybe we need to have mandatory PCT (it was mandatory in Sweden 1979-1993), and a change towards a more strict legislation. That the Swedish Forest Agency not only are giving advice but also can refer to a stricter legislation in their advisory work to private forest owners (i.e. “*you need to do this according to the law*”). The certification standards could also be clearer when it comes to economic aspects e.g. with requirements related to production, not only biodiversity.

Comments from participants in connection with the presentation:

- Per Petersson reacted on the strong production-orientation of the presentation, stressing that it cannot be sustainable to manage the forest in such a way that other values are threatened.
- Jan Lanner stressed that issues related to water are important, and that such issues only can be addressed on a landscape level (I don't know exactly what specific thing Jan Lanner was reacting to when he made this comment).

Theme 3. Measures to increase production in the small-scale forestry

In southern Sweden most of the forest is controlled by private forest owners, a heterogeneous group with different goals that manage their forests with a varying intensity. How can you make private forest owners as a whole interested in investing in a significant increase in production? Which opportunities and barriers complicate/enable vigorous efforts toward increased production within small-scale forestry? What could be done to activate private forest owners, which actors should be responsible for the implementation?

I (Isak Lodin, SLU) reported

It is important to conduct impact assessments of what effects different measures to increase production will have on other areas (such as biodiversity). There is tendency that some forest owners that buy estates not have wood production as their primary goal. It is therefore important with knowledgeable advisors in the future, which can provide advice tailored to the needs of the individual forest owner. The simulation that combined everything to maximize production looks great when it comes to increasing production but is not realistic to implement in practice. There are other measures to increase production that not were included in the simulations e.g. reforestation with exotic species such as *Abies grandis*, hybrid aspen and populus.

Theme 4. Forest policy and policy tools

The current Swedish forestry model gives the owner great freedom to decide how he/she wants to manage his/her forest. At the same time the forestry actors are taking their sector responsibility through the certification, where the certified forest owner restricts his/her choice of silvicultural measures on a voluntary basis. Firstly, do you believe that a big increase in production can be achieved within the frames of the current Swedish forestry model, characterized by "Freedom under responsibility", or does this requires changes in the current mix of forest policy tools (i.e. more/less legislation, subsidies, information-advisory services)? Which changes and efforts would be needed? Which obstacles to an increased forest production exists in the current certification standard (FSC, PEFC)?

Vilis Brukas reported

An important starting point is that the forest resource not can fulfill everything we want, trade-offs are needed. It is probably not realistic to expect 68 % increase in harvest in the coming century, but the direction is right, an increased production is needed.

If we look into the forest governance over the last century, the role of the Swedish Forest Agency have changed from hard steering to soft steering by education and advice, and now there is a change towards cooperation processes. The last thing is however quite unclear, and it is not clear what the goal is. The overall picture is that policy tools are quite little used in Sweden: the legislation is liberal, economical instruments are not much used, and steering through information has been reduced. The state seems to expect that advisory services towards forest owners should be carried out only by forest owner associations and industries. If the goal is to steer towards increased production there is a need for more clarity from policymakers, a clear political program for increased production. And it is important that other actors accept. We in the discussion group do not believe in hard steering through strict regulations, and our viewpoints are divided when it comes to subsidies. One alternative to think about is direct subsidies to support forest management measures, like the subsidies for PCT in Finland. Other alternatives are more radical measures targeting the entire system, such as subsidies to build in wood or climate tax on concrete. Informative policy tools need to be strengthened. It is important with consensus and understanding.

Theme 5. Current knowledge, tools and future research

There exists a wide range of measures that potentially can increase production, several of these are however very unusual, or not used at all, and there is a need of more research. Another problem is that the current decision support systems (such as Heureka) are reliable when it comes to conventional management, but less adapted to simulate the consequences of alternative forest management methods. If we are going to start vigorous efforts to increase production, which knowledge gaps are most important to overcome? Is there any particular areas where it extra important to invest resources? Do you have any suggestions on activities or projects?

Magnus Petersson reported

We have a good toolbox. Knowledge is partly lacking regarding how knowledge and results should be implemented in practice. Knowledge is needed regarding drivers behind the behavior of private forest owners and advisory services, how knowledge can be transferred and change the behavior in an effective way. There is a need to look into new ways and tools to communicate with private forest owners and test and evaluate how effective they are.

There also exists many knowledge gaps within the more traditional forest management research. Regeneration is maybe the most important one. We know too little about the relationship between the regeneration result and production, and about the importance of regeneration intensity. The growth models we have (e.g. in Heureka) cannot handle variation in regeneration success which means that we cannot clearly distinguish differences in growth due to varying regeneration intensity. Better knowledge in this area can have large effects since the knowledge can influence the management over very large areas.

Browsing damages, some things we already know, but ones again, it is hard to implement the knowledge in practice. To reach out with the knowledge to those that manage forests and game populations. There is a great potential to increase production if we would reduce the browsing damages. This concerns Scots pine, but also exotic species.

We lack knowledge regarding the management of exotic species, fertilization and irrigation. We also have problems to project and reduce damages of things that have a large effect on production.

A thought related to trade-offs between different values and how to reduce conflicts. Maybe a smart idea can be to shift focus, instead of looking into how you can maximize production, we can look into how we can minimize trade-offs between different ecosystem services. For example, mixed forests can give a lot of biodiversity without big losses of production.

3.2.5 15:40-15:55, Forest management in Småland in an International perspective [Anders Ekstrand, ALTERFOR/Södra]

Anders provided a short and very interesting presentation, with nice pictures, about forest management in three of the ALTERFOR case study areas (Slovakia, Portugal, and Ireland) that he visited during the course of the project. He also talked a little bit about forest management in Germany, a country he visited during a work trip with Södra. He emphasized large differences between case study areas in regard to forest policy, the land use history,

the ownership structure, the forest management intensity, market conditions and risks. He concluded that this implies that it will be very hard to implement a common forest policy within the European Union in a meaningful way.

3.2.6 15:55-16:10, Closing of the workshop + Short oral workshop evaluation

I closed the workshop and thanked all the participants. In association with this Vilis thanked me, Anders Ekstrand and Ljusk-Ola Eriksson for all the work we put down in preparing the workshop. In addition, instead of having an online workshop evaluation (like the last time), or some other type of evaluation, I asked all the participants to provide some oral feedback on spot. Here is a summary of the comments we received from the participants that stayed for the short evaluation:

Mattias Magnusson, the Swedish church:

A very interesting day, everything, especially the presentation by Henric Dernegård.

Tomas Höijer, Sydved:

I would like to know more about continuous cover forestry: effects on the climate, management methods etc. The basic knowledge does not exist.

Jan Lanner, the Swedish Forest Agency/Helgeå model forest:

An important take home message from the workshop is that we need to build more in wood to meet the challenges of the future. There should be an increased focus regarding the development of the region, the CABs role is also important (maybe referring in a subtle way to the fact that the CAB did not participate).

Hasse Bengtsson, the Swedish Forest Agency:

It would be nice to have had representatives from more actors present (referring to the strong dominance of Södra and SLU).

Eric Agestam, SLU:

Deeply impressed by the implementation of the workshop. It would be interesting with a continuation, and a deeper discussion of alternative methods in forest management. It would also be interesting to compare the discussion today with the discussion during the workshop that was organized together with the county administrative board (i.e. the first stakeholder workshop).

Malin Petersson, Södra:

The discussion in the group work was a little bit hampered by the fact that the participants had such different views regarding to what extent current forest management practices are sustainable.

Magnus Pettersson, Södra:

It is extremely interesting with scenarios, they can help you to get away from everyday work and think big. These type of projects are therefore very important. Today we are way to homogenous (i.e. referring to a strong dominance of wood productions interests among the participants), it would be nice if more actors with different viewpoints would have been

represented at the workshop.

Vilis Brukas, SLU:

That is correct (following up on Magnus comments), the discussions during the ALTERFOR workshop organized together with the County Administrative Board was much “hotter” due to a more diversified group of participants. Södra and SLU invited a lot stakeholders, but it seems to be hard to engage people to come, this is something to think about for the future.

3.3 Workshop follow up

As the workshop secretary, Vilis Brukas took notes during the workshop and compiled them into workshop minutes in Swedish. Approximately four weeks after the workshop I sent the workshop minutes, as well as the PowerPoint presentations from the workshop, to all participants.

3.4 Media coverage

The workshop was covered by our “department journalist” Pär Fornling, who has a lot of experience of writing for the Swedish forestry journals targeting practitioners and private forest owners. Pär produced a newsletter about the stakeholder workshop and the ALTERFOR project (see Appendix 2), that was published on the department homepage the 29th of October and on www.skogssverige.se a few days later (1st of November). Skogssverige is a webpage that gather news about various topics related to forestry and the forest sector in Sweden, in 2017 the webpage (i.e. skogssverige.se) had approximately one million visits.

4 Conclusions and lessons learned

In the Swedish case study we are now done with the stakeholder workshops. With the experience of both events fresh in my mind I will start by making some comparisons.

The structure of the program of the two workshops was very similar, a small difference was that the second stakeholder workshop started one hour earlier. A change that we made after experiencing a rather compact program in the first workshop, where especially the final discussion could have lasted for much longer if more time would have been available.

A major difference between the two workshops was that the green infrastructure workshop had much more discussions, where the participants argued for different standpoints, and made comments regarding things they didn’t agreed upon. Sure, the second workshop also had some discussions but they were overall concerned with clarifying information presented in the presentations, not so much discussions about to what extent the different alternatives presented were right or wrong. I can think about two potential explanations to the diverging outcome. Firstly, the first workshop had a higher diversity of stakeholders and the distribution of interests among the participants was also a bit more balanced (stakeholders working with nature conservation vs stakeholders working with forest management). This was definitely

something that stimulated discussions. Secondly, the more active discussions might also be connected to the fact that the green infrastructure workshop was something "real", i.e. a workshop within a policy process with potential future consequences for the participating organizations. More is at stake in such an environment and it can therefore be more important to express opinions and concerns. The workshop with Södra addressed different measures to increase production related to climate change mitigation. Yes, this is also a hot topic within the forest sector, but even though we want our workshops to matter, we still need to accept that such a workshop overall has very little influence over to what extent production oriented measures will be implemented in practice. I believe that this can make participants more prone to listen and relax rather than to embark in a lot of discussion.

Regarding the diversity of participants, we can of course only judge the outcome with the current group, and with more diversity we would probably have had other problems. I believe that with a lot of stakeholders with conservation interests, it might have been difficult to have constructive discussions in the group work (based on my and Malin's experience, see 3.2.4 and 3.2.6). In any case, regardless of pros and cons, the goal in the end was to have a diverse group of stakeholders. In this regard it was a pity that we didn't attract more interest from the invited stakeholders. If we for some reason would organize more workshops within ALTERFOR in the future we should be more active when inviting stakeholders. For example, send more reminders and make phone calls to key stakeholders.

Despite some room for improvements the workshop was successful and we received quite a lot of positive feedback from the participants. I especially liked how the presentations by Tomas, Henric and myself were based on investigations using different methods, but all reached the same conclusion i.e. that if we want to use the forest resource to mitigate climate change we need to invest in measures to increase growth. This indicate that the workshop addressed an important contemporary and future challenge for the forest sector, but also that the conclusions drawn by the ALTERFOR researchers seem to be correct.

The collaboration with Södra has worked very well, and after having rather weak contact with Södra in the beginning of the project we have now established a really good relationship with Anders Ekstrand, who take part in a lot of ALTERFOR events (the cross-project meetings). It was easy to collaborate with Södra in the preparation of the workshop. They could communicate a clear idea about what they wanted with the workshop, and in line with the stakeholder orientation emphasized by the RIU-modell we adapted accordingly. At the same time they gave the ALTERFOR researchers working with the simulations (myself and Ljusk-Ola Eriksson) a high degree of freedom in designing the alternative level simulations and didn't bother too much with the details. This freedom was helpful considering the difficulties, complexities and all the hard work that were associated with getting the simulations ready for the workshop in time. Södra was also helpful with offering to host the workshop at their headquarters, finding speakers and take care of the registration of participants. This far I think that the collaboration with stakeholders in workshop preparation and implementation is something that been highly successful in the Swedish case study. Hopefully the relationships we established can be useful during the remainder of the project and in future spin-offs.

References

- Böcher, M., Krott, M., 2016. Science makes the world go round: Successful scientific knowledge transfer for the environment. Springer.
- Juerges, N., Krott, M. et al. 2017. D4.1 - Internal Actor Analysis Report. ALTERFOR project.
- Lodin, I., 2017. Workshop concept CSA Kronoberg. ALTERFOR Project.
- SFA (Swedish Forest Agency), 2018. Produktionshöjande åtgärder - Rapport från samverkansprocess skogsproduktion [Measures to increase production– Report from the collaborative process wood-production]. Rapport 1-2018. Swedish Forest Agency, Jönköping (In Swedish).

**RÄCKER SMÅLANDS SKOGAR TILL ALLA?
Handlingsalternativ för en hållbar framtid inom familjeskogsbruket
Workshop 3 oktober 2018**

Inom projektet ALTERFOR har SLU och Södra simulerat skogens tillväxt och utveckling i olika framtidsscenarier. Skogsindustrin behöver virke och är en av motorerna i den Småländska ekonomin samtidigt som allt mer mark används för naturvård och rekreation. Hotet från klimatförändringarna innebär att denna målkonflikt blir alltmer konkret, då omställningen till en biobaserad ekonomi innebär att användningen av den förnyelsebara skogsråvaran behöver öka. För att klara av denna utmaning krävs det framtida åtgärder för att öka skogsproduktionen på virkesproduktionsmark. Detta väcker en hel del viktiga frågor så som: Hur stor potential finns det att öka tillväxten och avverkningen på kort och lång sikt? Vad innebär de föreslagna ökade kraven på avsättningar och/eller anpassad skötsel i FSC standarden för möjligheten att öka den framtida avverkningen? Vilka produktionshöjande åtgärder är mest effektiva och realistiska att implementera i praktiken? Vilka hinder försvårar eller omöjliggör i dagsläget genomförandet av olika produktionshöjande åtgärder? Vilka kunskapsluckor är viktigast att adressera med framtida forskning?

Södra skogsägarna och Sveriges Lantbruksuniversitet bjuder in till en heldags workshop på Södras huvudkontor i Växjö den 3 oktober med syftet att belysa de ovanstående frågorna. Följande delmoment är planerade inom workshopen:

9:00-9:15 Välkommen [Magnus Pettersson, Skötsel och Teknikavdelningen, Södra]
9:15-10:00 Södras skogspolitiska arbete, industrins behov av råvara, så tänker den småländske skogsägaren [Göran Örlander, Thomas Rahm, Henrik Brodin, Södra]
10:00-10:15 Fikapaus
10:15-12:00 Heureka-simuleringar med olika handlingsalternativ i Kronobergs län [ledd av doktorand Isak Lodin och professor Ljusk-Ola Eriksson, SLU]
12:00-13:00 Lunch
13:00-14:30 Diskussion om handlingsalternativ och vägar framåt [arbete i grupper]
15:00-15:45 Sammanfattande diskussion från grupparbetet
15:45-16:00 Avslutning, Smålands skogsbruk i ett internationellt perspektiv [Anders Ekstrand]

Vi bjuder på lunch och fika under dagen. Anmäl er genom att maila eller ringa till Anders Ekstrand.

Tid och plats: 3 oktober kl 9-16. Gösta Edström salen, Södras huvudkontor, Skogsudden, 351 89 Växjö. Anmäl er till mailadress nedan. Ange önskemål om speciell kost.

Anders Ekstrand
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Skog Alnarp



Utmaning: Maxa produktionen

En väg för att möta klimatförändringarna är att maximera tillväxten och öka användningen av förnybar råvara från skogen.

För att testa möjligheterna har forskarna ställts inför frågan om avverkningarna i Kronoberg kan öka med 68 procent inom 100 år.

Utmaningen är en del av arbetet inom Alterfor. Det är ett EU-finansierat projekt som undersöker hur man med olika skogsskötselmetoder kan hantera framtidens utmaningar. Det samordnas av Sveriges lantbruksuniversitet med Ljusk-Ola Eriksson som koordinator och Vilis Brukas vetenskaplig ledare.

Nio länder är involverade. I varje land har ett område valts ut. För Sveriges del är det Kronobergs län med många privata skogsägare.

DOKTORAND Isak Lodin har delat in skogsägarna i olika kategorier, gjort djupintervjuer och framför allt används



Magnus Petersson, Södra, och professor Urban Nilsson diskuterar möjligheterna att öka produktionen, under överinseende av Södras grundare Gösta Edström.

analysprogrammet Heureka för att göra prognoser inför framtiden.

- En viktig del i arbetet är att diskutera möjligheterna med de som arbetar praktiskt med frågorna. Det blir en komplettering och test av våra teoretiska modeller, säger Isak Lodin.

I VÅRAS genomfördes en workshop tillsammans med länsstyrelsen med tyngdpunkt på biologisk mångfald.

I början av oktober, med Södra som värd, låg fokus på maximal produktion för att mota klimatförändringen.

I ALLA de nio deltagarländerna testas några olika scenarier.

I ett av dem är målet att öka avverkningarna med 16 procent till år 2110. Det är inga problem i Kronoberg eftersom skogen dessutom förutses växa betydligt bättre genom 2,5 graders varmare klimat.

Den verkligt tuffa utmaningen är att skruva upp avverkningsvolymen med 68 procent under förtusättningen att temperaturen ökar med måttliga 1,5 grader.

ISAK Lodin har testat flera handlingsalternativ:

✓ God skogsvård med bättre förnygringar, ordentliga röjningar och ståndortsanpassning, inte minst genom

att plantera tall på den mest lämpade marken. Idag blir det ofta gran på grund av problem med älgbete.

✓ Granplantor som tagits fram genom somatisk embryogenes De växer 30 - 40 procent bättre än oförädlade plantor. Tekniken går ut på att massföra de bästa av de bäst förädlade plantorna.

✓ Återkommande gödslingar av tallskogen. Idag görs ingen gödsling på grund av Skogsstyrelsens "allmänna råd".

✓ Förnygring med hybridlärk på en fjärdedel av den bättre marken. Hybridlärken antas växa 30 procent bättre än granen och kan slutavverkas efter 40 år.

UTGÅNGSPUNKTEN är att avsättningarna för naturvård förblir desamma, vilket gör att betydande arealer inte är tillgängliga för avverkning.

- Vi räknar dessutom med att den kommande FSC-standard sänker den framtida avverkningspotentialen med ett par procent, säger Isak Lodin.

DET som ger bäst utväxling av handlingsalternativen, runt 10 procents ökad tillväxt vardera, är bättre skogsvård och högförädlade granplantor.

Övriga alternativ ger några procent vardera.

Bättre förnygringar med plantering av högförädlade



Isak Lodin, doktorand på institutionen för sydsvensk skogsvetenskap.

plantor tillhör alltså det som ger bäst utdelning. Resultaten förstärks av bra röjning.

En nyckelfråga för att ta vara på potentialen är hur skogsägarna ska aktiveras för att genomföra åtgärderna.

De möjliga verktygen är lagstiftning, rådgivning och ekonomiska styrmedel.

Vid mötet identifierades effektiv rådgivning som en avgörande fråga.

FÖR ATT nå målet krävs det en kombination av alla de fyra handlingsalternativen: Bättre skogsvård, gödsling, bättre granplantor och hybridlärk (eller andra "främmande trädslag").

- I en framtid med ett ambitiöst klimatarbete är det troligt att skogen får en nyckelroll. Då kan skötselmetoder som idag anses väldigt intensiva bli aktuella att använda i större skala

- Modellen ger förstås inga absoluta sanningar, men ger ändå en bild av möjligheterna säger Isak Lodin.