

Milestone 18 – 1st Stakeholder Workshop

First Swedish Stakeholder Workshop: Workshop documentation

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1 Introduction

This report is a summary of the preparation and implementation of the first ALTERFOR stakeholder workshop in the Swedish Case Study Area (CSA), and thereby fulfills the requirements in WP4 to document the stakeholder workshops (MS18 and MS19). The workshop, that was organized the 8th of May 2018, addressed County Administrative Board's (CAB's) ongoing work with the project "green infrastructure" and related strategies to promote the nature values of the production forest in the CSA. The workshop was organized together with the CAB in Kronoberg County.

2 Workshop preparation

2.1 Selection of a workshop topic

According to the ALTERFOR workshop guideline the two stakeholder workshops should address distinctively different topics, one suggestion was that this could be done by focusing on different forest functions and, accordingly, stakeholder interests (e.g. wood production workshop versus nature conservation workshop). In the Swedish CSA we have the powerful industrial forest owners association Södra as our non-academic partners. Consequently, it was more or less clear already from the start that one workshop would be arranged together with Södra and focus on wood production. The conflict between wood production and biodiversity conservation, has been, and still, is the dominating conflict in Swedish forest management (Juerges et al., 2017). Since the revision of the forestry act in 1993, where it was stipulated that wood production goals and environmental goals are equally important, the importance of biodiversity conservation in Swedish forest management has increased considerable. Inspired by the suggested "workshop divide" between different forest functions, we therefore thought it would be relevant to focus the other workshop on some important issues related to nature conservation. In spring 2017 I (Isak Lodin) was informed by Vilis Brukas about CABs ongoing work with the project green infrastructure. We both thought that trying to involve ALTERFOR in green infrastructure seemed like a good idea. The CAB is together with the Swedish Forest Agency the most powerful actor in nature conservation in the CSA (Juerges et al., 2017), and by engaging ALTERFOR in green infrastructure we could connect our research and alternative forest management models (aFMMs) to an ongoing processes in forest and nature conversation policies. Altogether, this seemed like a strategy that would bring our scientific work closer to practice and thereby raise the possibility for practical implementation.

Green infrastructure is a mission assigned to the Swedish Environmental Protection Agency (SEPA) by the Swedish government, where the CABs are responsible for the implementation at county level. Green infrastructure can be seen as an emerging platform for improved landscape level coordination and dialog regarding biodiversity conservation and the management of other ecosystem services. It thereby try to address the current lack of a sufficient landscape level perspective in Swedish forest management, a problem that partly is related to the fragmented ownership structure characterizing many parts of the country (including the CSA). The green infrastructure action plan that should be finalized in October 2018 should include a geographical survey of valuable habitats (and ecosystem

services) as well as proposal of different measures to enhance the existing values. Considering that the project is ongoing, the outcome, future financing and implementation (e.g. in relation to different forest policy instruments) of green infrastructure at national and county level is still uncertain.

In June 2017 I contacted the project leader for green infrastructure at CAB Kronoberg, Mårten Västerdal, and asked if he were interested in getting assistance from the Swedish ALTERFOR team in his work, and in addition arrange a stakeholder workshop together. Mårten was positive already from the start, and through frequent contact over e-mail and phone during the summer and early autumn some preliminary ideas regarding the workshop topic gradually emerged. These ideas were compiled in the Swedish workshop concept (Lodin, 2017) that was sent to the WP4 leaders and presented at the ALTERFOR meeting in Galway.

The Swedish ALTERFOR team had a first planning meeting with Mårten and Jan Lannér from the Swedish Forest Agency/Helgeå model forest the 24th of October. Together with Mårten we had already decided to conduct the landscape level simulations that would be presented at the workshop in the Helgeå river basin, thereby utilizing the Helgeå model forest as a platform for interacting with stakeholders. It was therefore considered important to involve Jan Lannér early on in the workshop preparations. This initial planning meeting included several presentations about the ALTERFOR project, Mårtens ongoing work with green infrastructure and a presentation about the Helgeå model forest by Jan Lannér. The last part of the meeting was devoted to an open discussion about finding a suitable workshop topic, a discussion that continued with frequent e-mails during the following weeks. At the end all persons that were involved in the discussion (Mårten Västerdal, Jan Lannér, Vilis Brukas, Isak Lodin and Ljusk-Ola Eriksson) agreed on the following workshop topic, as well as a plan for the future work:

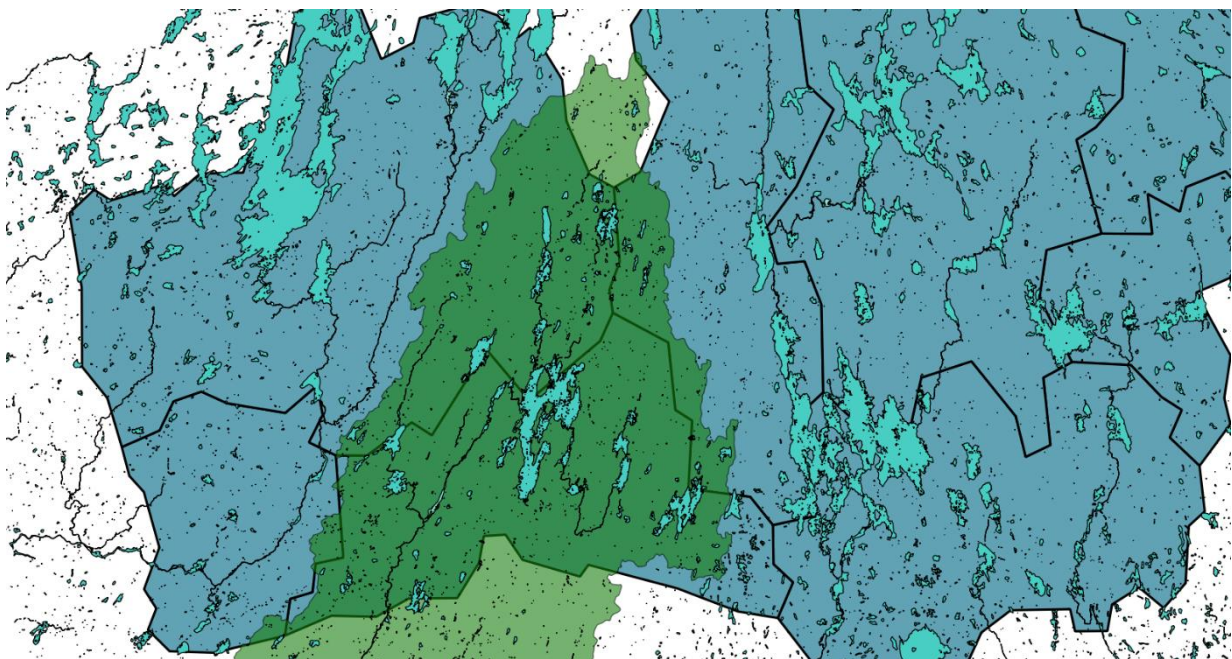
- The workshop would address CABs current work with green infrastructure, focusing on starting a dialog with the forestry stakeholders regarding different strategies to enhance the nature values of the production forest. This is highly relevant in the CSA, where forests of high conservation values are both scarce and fragmented. This implies that the quality of the production forest matrix is crucial for maintaining connectivity and preserving biodiversity.
- The landscape level simulation would be conducted in the Helgeå river basin in Kronoberg County, consisting of approx. 100,000 hectares of productive forestland (this reflected a shift towards a more regional focus, since the initial plan was to make the simulations in a smaller area, see Lodin, 2017).
- Relevant alternative FMMs would be identified based on the development of biodiversity indicators in the landscape level simulations with current FMMs.

Finally, from this moment and onwards the preparation of the workshop were solely conducted by Mårten Västerdal and the ALTERFOR researchers, with no involvement from Jan Lannér. At this moment, I cannot recall the exact reasons to why Jan Lannér not was

invited to subsequent meetings, in retrospect I believe that it would have been a good idea. One reason might be the gradual shift from a local (i.e. simulations in a small area, workshop with local stakeholders using the Helgeå model forest, see Lodin, 2017) to a regional focus (i.e. targeting stakeholders active in the entire CSA) that occurred as the preparation moved forward.

2.2 Deciding on the landscape level simulations with aFMMs

The simulations that were presented at the workshop were conducted in the Helgeå river basin in Kronoberg County (Picture 1) (see Eriksson and Lodin, 2018, for a detailed description of the simulation settings and results), a rather typical forest landscape in the CSA, dominated by the native conifer tree species (especially spruce) and by small-scale private forest ownership.



Picture 1. Picture showing the Helgeå river basin in Kronoberg (where blue and green overlaps). Kronoberg County (blue), Other counties (white), Helgeå river basin (green).

All simulations were conducted within the frames of the intermediate IIASA scenario EU-BIOENERGY (Figure 1). This scenario implies an 16 % increase in total annual harvest (compared to the current harvest in the CSA) and 2,5 degrees increase in global temperature (compared with the pre-industrial level) in 2110. The scenario was chosen due to pragmatic reasons, with the target group of the stakeholder workshop clearly in mind. The increased harvest level in the scenario is in line with the forestry actors' interests to increase wood production, and would therefore facilitate acceptance of the scientific results. At the same time, 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 in this projected future there is a great potential to implement various nature conservation oriented measures within the frames of an increased annual harvest. This conclusion is also valid for the future projected in REFERENCE (+ 24 % in harvest/+ 3,7 degrees in 2110) , but contrasts with GLOBAL BIOENERGY (+ 68 in harvest/+ 1,5 degrees in 2110), where the big increase in demand

implies that further intensification of forest management is needed. Hence, the selection of this scenario reflect an ambition to find WIN-WIN solutions (i.e. increasing wood production while at the same time implementing management strategies that would improve the nature values of the production forests) within the frames of an realistic, but still ambitious, climate change mitigation scenario. This was also reflected in my communication strategy at the workshop (see workshop implementation, section 3.2.3). Finally, I (Isak Lodin) was the one that suggested that this scenario would be used in the simulations, and Mårten Västerdal accepted my proposal with no objections.

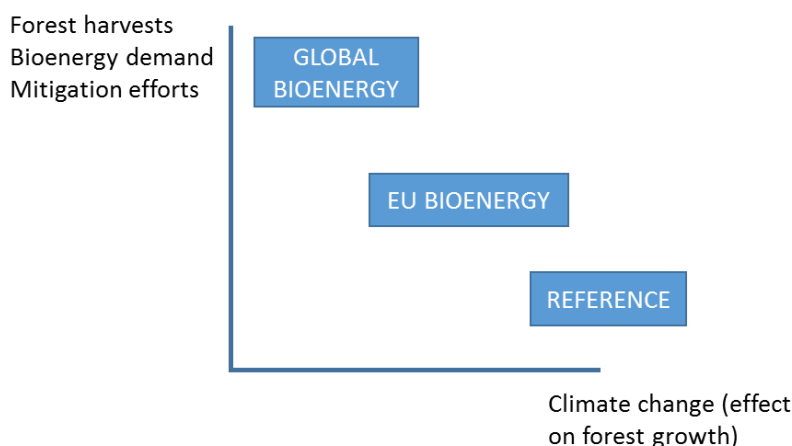


Figure 1. Top-down scenarios in ALTERFOR with respect to the climate mitigation efforts and the climate change.

In line with our established work plan, the selection of aFMMs (as well as changes in the coverage of current FMMs) to incorporate into the alternative landscape level simulations were made based on the results of the simulation with current FMMs. Our alternatively put, these results established a problem formulation regarding important biodiversity indicators, that subsequently guided our search for viable strategies to increase the nature values of the future forest landscape.

The result of the simulations with current FMMs was presented during a full day meeting on the 14th of March 2018 at CABs office in Växjö. Due to a buildup of standing volume, and ageing of set-asides and retention patches, the results showed positive trends for the biodiversity indicators related to the native conifers (area of old forest, volumes of larger trees, deadwood). Meanwhile indicators related to broadleaves, and the especially the more uncommon broadleaved species (e.g. aspen, oak, beech) where flat or decreasing. This can be explained by the current reforestation practices that are totally dominated by Norway spruce. At the meeting it was therefore decided that the alternative landscape level simulations would focus on investigation the effects of different strategies that would increase the share of broadleaved forests (share of the productive forest area) and broadleaved trees (share of total volume). In the long run this will also have an effect on biodiversity indicators indicating high nature values (e.g. old forests rich in broadleaves, large oaks, course deadwood of broadleaves etc.). Beyond finding strategies that would improve the targeted biodiversity indicators, a key concern was to find aFMMs that would be possible to incorporate into our decision support system (DSS) Heureka. All these issues

were discussed at the meeting, and over e-mail during the following weeks. At the end we (Isak Lodin, Ljusk-ola Eriksson, and Mårten Västerdal) all agreed to incorporate the strategies described in Table 1 into the alternative landscape level simulations.

Table 1: Strategies to increase the share of broadleaves implemented in the alternative landscape level simulations.

Border zones with/without management
Description: Approx. 15 m wide border zones along freshwater, open areas, human facilities are excluded from conventional forestry. These zones are left unmanaged or managed with thinning operations promoting broadleaves at the expense of conifers. In total the border zones covered approx. 9 % of the productive forest land in the simulated landscape.
Motivation: Edges towards water and open land are often characterized by a different tree species composition, and more broadleaves. We wanted to see if this was the case in the simulated landscape. If this would be the case it could be an effective nature conservation strategy to exclude them from conventional forestry.
Spruce-Birch Mixture
Description: Planting Norway spruce at a lower seedling density (approx. 1500 seedlings/ha) and utilize the naturally regenerated birches. This is followed by a precommercial thinning and commercial thinning program that maintains >35 % birch throughout the rotation. This aFMM replaced monoculture plantations with Norway spruce in the simulations.
Motivation: Compared to planting broadleaves this aFMM has lower implementation barriers. The forest owner get the birches free of charge, and the establishment cost is reduced due the reduced seedling density of Norway spruce.
Oak for wood production
Description: Establishment of a pure oak plantations with financial support by SFAs subsidies for noble broadleaves. The management is oriented towards producing high quality oak timber. This FMM (that was excluded from the simulations with current FMM since it is very seldom used) was replacing monoculture plantations of Norway spruce on fertile sites.
Motivation: Oak is a tree species that has very high biodiversity values. The current lack of establishment of Oak in the CSA is therefore problematic. In addition, in the Helgeå river basin there are some areas with a higher density of valuable noble broadleaved forests. These values wood be enhanced by increasing the share of oak in the surrounding production forest matrix.

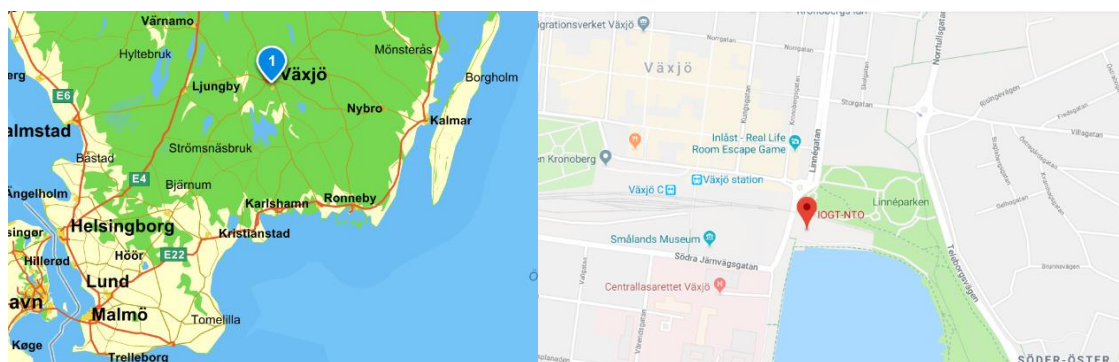
These strategies were subsequently incorporated into the alternative landscape level simulations. Table 2 shows an overview of all the simulations that were conducted and subsequently presented at the stakeholder workshop.

Table 2. Landscape level simulations in the Helgeå river basin presented at the 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.
Border zones without management
Description: Approx. 9 % of the productive forestland exempted from all type of management. Otherwise the same settings as forest management with current FMMs.
Border zones with management
Description: Approx. 9 % of the productive forestland managed with thinnings to promote broadleaves at the expense of conifers. Otherwise the same settings as forest management with current FMMs.
Oak + Spruce-Birch mixture
Description: Establishment of oak on 25 % of the reforestation area with mesic and moist soils and \geq 30. Establishment of Spruce-Birch mixture on 25 % of the reforestation area with mesic/moist, moist and wet soils. Otherwise the same settings as forest management with current FMMs.

2.3 Selecting dates and location of the Workshop

Together with Mårten Västerdal it was decided early on in the planning process (June 2017) to organize the workshop in May 2018. This would enable Mårten to incorporate the results from the landscape level simulations with current and alternative FMMs, as well as the outcome from the stakeholder workshop into the action plan for green infrastructure, which should be finalized in October 2018. At the planning meeting on the 24th of October we agreed upon a few dates in May that worked for all the participants. Mårten Västerdal was assigned the task of finding a location in Växjö where we could arrange the stakeholder workshop, and in January 2018 it was decided that the workshop should take place in the IOGT-NTO house in Växjö the 8th of May (Picture 2). As the residential town of Kronoberg and the location of CABs office, Växjö can be regarded as a natural location for a stakeholder workshop addressing CABs work with green infrastructure in Kronoberg. In addition, even though the simulations were conducted in the Helgeå river basin, the target group were stakeholders working in the entire county, which made Växjö a good choice. The IOGT-NTO house was a really good place to arrange the workshop. It is situated centrally in Växjö only a short walk from the train station, and was therefore a really good for those of us that arrived to Växjö by train. In addition, it can be considered to be a “neutral” location, not coupled with any of the main stakeholders.



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

2.4 Selection and invitation of Stakeholders to the workshop

The invitation letter to stakeholders was prepared by Mårten Västerdal, Isak Lodin and Vilis Brukas in January 2018. The selection and invitation of stakeholders was made by Mårten Västerdal who made a selection from a list of contacts that he had established in his earlier work with green infrastructure. The invitation letter (see appendix 1) was sent out over e-mail to representatives of stakeholders listed in Table 3 in early February, and a reminder was sent out one month later. With a few exceptions, Mårten was the one in charge of all stakeholder contacts during the months before the workshop. Despite the fact that the landscape level simulations were conducted in a smaller area of the CSA, the target group of the workshop was regional (whole of Kronoberg) rather than local (i.e. Helgeå river basin). This reflects the fact that the workshop addressed issues related to the ongoing work with green infrastructure in the entire county. In addition, the simulations should be seen as a local case touching upon issues that are relevant for the entire CSA (e.g. the importance of promoting the establishment of more broadleaves).

Table 3. Organizations invited to the stakeholder workshop.

Organisation	Description
Swedish Forest Agency	The governmental agency in charge of implementing national forest policy.
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.

2.5 Deciding on a workshop program

A rough workshop program, consisting of presentations from SLU and CAB combined with group work and plenary discussions, was put down in association with the preparation of the invitation letter. In the communication with Mårten during this period, the involved ALTERFOR researchers (Isak Lodin and Vilis Brukas) stressed the importance of mixing

presentations with activities that would activate the participants. In addition, we stressed several times that the workshop would be more interesting for the stakeholders if it was clearly related to Mårten's ongoing work with the action plan for green infrastructure, thereby avoiding long and decontextualized presentations of simulation results by ALTERFOR researchers. Mårten seemed to agree with our proposals, and these ideas were consequently clearly reflected in the invitation letter that was sent out to the stakeholders.

From this moment and onwards all the way to the workshop implementation, Mårten took the leading role in preparing the workshop, while the ALTERFOR researchers concentrated their efforts on finalising the Heureka simulations. Mårten took the initiative to invite an independent forest consultant Per Petersson to present real examples of nature conservation measures at the workshop. The idea was that these practical examples would act as a complement to the more theoretical and general results from the Heureka simulations, and in addition capture some of the nature oriented measures that not are possible to simulate in Heureka. With assistance from myself, Mårten prepared a detailed workshop program that was sent out to all the participants one week before the workshop (see appendix 2). The questions that would be addressed in the group work were prepared by Mårten the week before the workshop. The questions were prepared with some assistance from myself and Vilis Brukas, we also provided some suggestions of relevant questions to include.

3 Workshop implementation

3.1 Participants in the Workshop

In total 19 persons participated (Table 4). Overall, the target group, which was defined by the invitation e-mail sent out by Mårten Västerdal, was quite well represented. Beyond staff from SLU and CAB the participants included representatives from the Swedish forest agency, local forestry stakeholders (Sydved, Skogssällskapet, Södra, Vida) and the lobby group for Swedish forest owners and farmers (LRF). ATA, Såg i Syd and Sveaskog were all invited (Table 3) but did not participate. Sveaskog owns 58,900 hectares of productive forestland in Kronoberg County. Due to their large ownership in the CSA and elsewhere (approx. 14 % of the Swedish forests), and relatively high ambition in nature conservation, they should have great insights regarding working with nature conservation at landscape level. It was therefore unfortunate that they could not participate (due to a late cancellation). Luckily, as a former employee at Sveaskog, Per Petersson was partly filling in this gap, sharing practical examples of nature conservation measures implemented in Sveaskog's forests. Finally, the persons that participated in the workshop were not always the same persons that was invited in the e-mail. This can be explained by internal communication within the participating organisations.

Table 4. Participants in the stakeholder workshop.

Name	Organisation
Jan Lannér	Swedish Forest Agency/Helgeå model forest
Bo Hultgren	Swedish Forest Agency
Eva Johansson	Swedish Forest Agency
Per Petersson	Nature conservation consultant
Anders Ekstrand	Södra/ALTERFOR
Karl-Johan Gunnarson	Södra. Elected member from Tingsryd-Linneryd forest management district.
Adam Felton	SLU/ALTERFOR
Vilis Brukas	SLU/ALTERFOR
Isak Lodin	SLU/ALTERFOR
Pär Fornling	SLU
Ljusk-Ola Eriksson	SLU/ALTERFOR
Helene Pettersson	County administrative board Kronoberg
Love Eriksen	County administrative board Kronoberg
Mårten Västerdal	County administrative board Kronoberg
Thomas Höijer	Sydved
Christin Kvennefeldt	Skogssällskapet
Mattias Magnusson	Växjö Parish, the Swedish church
Pelle Ström	Vida skog AB
Helene Lantz	LRF (The Federation of Swedish Farmers)

3.2 The program

3.2.1 10:00-10:15, Coffee and round of presentation

The stakeholder workshop started with coffee and a short round of presentation of all the participants. Mårten Västerdal, who chaired the workshop, greeted everybody welcome. By referring to the lack of an established forum to discuss nature conservation issues in forest management he tried to stress the importance of the event.



Picture 3. The project leader for Green infrastructure at CAB Kronoberg, Mårten Västerdal, speaker and chair at the first ALTERFOR stakeholder workshop.

3.2.2 10:15-11:00, Presentation about Green infrastructure by Mårten Västerdal

Mårten started with an introductory presentation about CABs ongoing work with green infrastructure with the title *“Forest perspectives on green infrastructure in Kronobergs County – Where are we? Where do we want to go?”* (*“Skogliga perspektiv på grön infrastruktur i Kronobergs län – Vart är vi? Vart vill vi?”*). Using beech forest as an example, Mårten talked about current challenges for biodiversity conservation in the county. Due to human activities the forests with high conservation values are fragmented, which implies that maintaining/increasing connectivity between valuable habitat patches is important for the future survival of many threatened species. Kronoberg County is a highly forested county, with active forest management. This implies that efforts to promote landscape level connectivity needs to focus on the nature values of the ordinary production forests, since these types of forests constitutes the landscape level matrix in which the “islands” of valuable forests are embedded. In his introductory presentation Mårten also specified the thematic focus of the workshop in three questions:

- How does the future look?
- Do we need to do anything to address fragmentation and barrier effects in the forest landscape?
- How can we do this in the best way?

The following topics was raised in the discussion that followed the presentation:

- Mårten Västerdal said that the future work with increasing the nature values within the frames of green infrastructure hopefully would receive some financial resources. Anders Ekstrand (Södra) objected, and stressed that the big sums that would be required made such funding rather unlikely.
- The work with green infrastructure should work with different types of measures (general consideration-targeted measures) and on different spatial scales (landscape level-stand level). The work will be hampered by the ownership structure with many small properties.
- Differences related to the situation for noble broadleaves between Kronoberg and Skåne (a neighboring county south of the CSA) were discussed. Thomas Höijer (Sydved) and Anders Ekstrand (Södra) stressed that private forest owners in Kronoberg are much more reluctant to establish noble broadleaves due to the restrictive policy implementation by the SFA e.g. prohibiting final felling of noble broadleaves. According to Jan Lannér from the SFA, this (prohibiting final fellings) can be explained by the small share of noble broadleaves in Kronoberg, which makes the existing noble broadleaved forests more valuable.

3.2.3 11:00-12:00, Results from simulations in Heureka by Isak Lodin

In a presentation with the title: *“Alternatives to increase the nature values of the production forests- results from Heureka simulations in Helgeå river basin (Handlingsalternativ för att förbättra produktionsskogens naturvärden - Resultat från Heurekakörningar i Helgeåns avrinningsområde)”* I (Isak Lodin) presented the results of the simulations described in Table 2. To make my presentation interesting for the target group (with many persons with a lot of knowledge about forest management) I tried to clearly visualize the trade-offs between wood production and increased nature values. At the same time I tried to convey simulations results showing that substantial changes towards more biodiversity-friendly FMMs are possible without threatening current (and even slightly increased) harvest levels. An example of a PowerPoint slide that was used to try to communicate this message is shown in Figure 2. The trade-offs between wood production and nature values are evident by the higher harvest intensity in the simulations where mixed forests and Oak has been incorporated, which can be explained by the lower growth when broadleaves are replacing Norway spruce (and the harvest follows the level defined by the IIASA EU-BIOENERGY scenario for both simulations). At the same time it is evident that the opportunities for increased nature consideration that gradually emerges over the simulation period (i.e. the difference between harvest/growth=1 and the blue line) still not are fully exploited (because the orange line is well below harvest/growth=1).

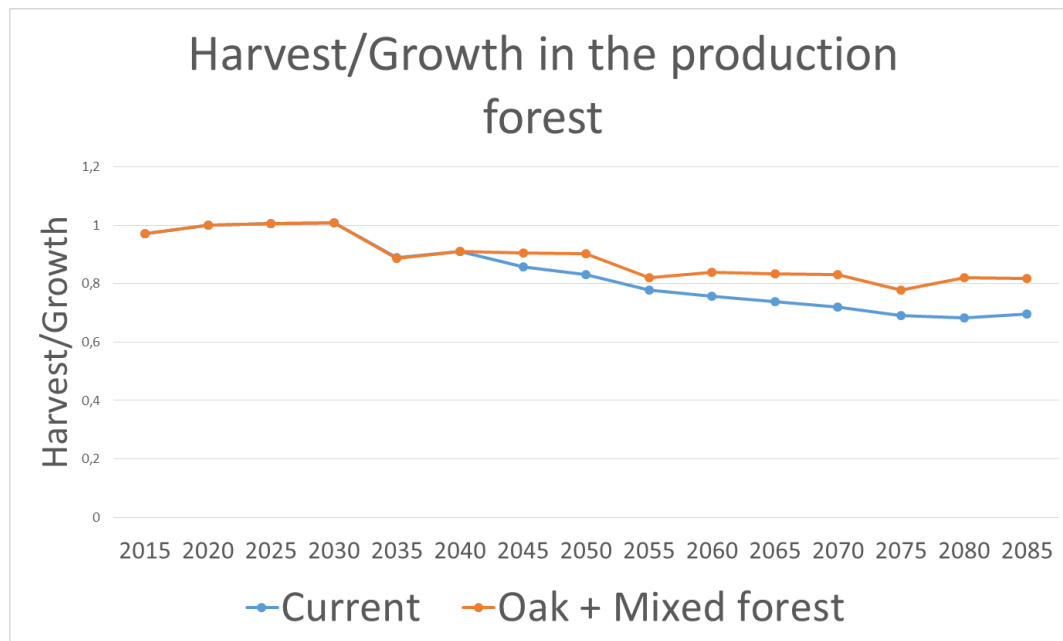


Figure 2. Example of commonly used figure in the presentation to communicate the possibilities to increase the nature values of the production forests within the frames of the IIASA scenario EU-BIOENERGY.

Following is a short summary of the results from the simulations that I presented in my PowerPoint presentation:

Forest management with current FMMs

- The growth is higher than the harvest throughout the entire simulation period which results in an increased standing volume. This indicate that it is possible to further increase the share of set-asides, or implement aFMMs to promote the nature values of the production forests, within the frames of the harvest level of the scenario.
- The “ageing” of set-asides and retention patches gives a positive development for biodiversity indicators (old trees/forest, deadwood) related to our most common tree species (birch, pine, spruce).
- If current forest management practices remain intact the future forest landscape will be characterized by denser and darker forest, the volume share of spruce and birch will increase, while the volume share of pine will decrease. The rotation periods will decrease. There is a lack of new establishment of valuable noble broadleaved forests.

Border zones with/without management

- Retaining border zones have a positive development on several important biodiversity indicators (e.g. big trees, older forest and deadwood). This can be explained by the fact that a larger share of the forestland is exempted from conventional forestry.
- In the simulation with border zones without management the rest of the forest needs to be managed more intensively to reach the harvest level in the EU BIOENERGY scenario. During two periods the harvest level cannot be reached.

- The tree species distribution in the border zones does not differ a lot from the tree species distribution in the rest of the forest. Despite this, the retention of border zones results in a big increase in the volume of valuable broadleaved species. These results are probably unrealistic and more studies are needed to study the tree species composition of the border zones.

Oak + Spruce-Birch mixture

- A big increase in the establishment of Oak and mixed forest are in line with current forest policy goals aiming for increased variation in forest management. However, forest management is an activity with long times frames, and the simulations showed that the positive effects on important biodiversity indicators comes with a great time lag.
- Replacing Norway spruce plantations with Oak and Spruce-Birch mixtures results in reduced growth compared with the simulation with current FMMS. However, the predefined harvest level in the EU-BIOENERGY scenario could be achieved for all periods and the harvest was never higher than the growth. The reduced growth associated with large scale implementation of these two management systems are compensated by the increased growth due to climate change.
- Due to the current browsing pressure plantations of oak need to be fenced which makes it very costly. The Swedish Forest Agency (SFA) offers grants to compensate forest owners for the extra costs. To establish the oak plantations in the simulations also in reality would require 240 million SEK in grants from the SFA.

The following topics were raised in discussions between different stakeholders during my presentation:

- Love Eriksen (CAB) and Anders Ekstrand (Södra) discussed whether or not the voluntary set-asides (that are protected throughout the entire simulation period in all the Heureka simulations) will be kept protected also in the future. This is an issue that often is discussed in Sweden, because the voluntary set-asides lacks legal protection from conventional forestry, which makes some stakeholders (mainly stakeholders promoting nature conservation) question to what extent they actually should be accounted for in the statistics.
- Discussions about to what extent the improvement of biodiversity indicators in the simulations would stop the extinction of threatened species.
- The big increase in broadleaves in the simulation “Oak + Spruce-Birch Mixture” can only be achieved if the problem with the high browsing pressure is solved.



Picture 4. PhD student and LCC Isak Lodin presenting the results of the current and alternative landscape level simulations at the stakeholder workshop.

3.2.4 13:00-13:30, Examples of conservation oriented management by Per Petersson

After a one hour lunch at a nearby restaurant we continued with a shorter PowerPoint presentation by Per Petersson. After many years at Sveaskog, Per is nowadays an independent consultant with an expertise in management measures oriented towards promoting environmental and social values. In his presentation Per presented several examples of measures for increasing environmental and social values that have been already adopted in selected forest estates. The examples included among other things: releasing old oaks from competition on overgrown historical wood pastures; restoring wooded meadows, plugging of ditches to restore wetlands, create broadleaved forests by removing spruce and so-called alley cuttings of spruce along roads. He highlighted that restoring pastures might be the most important conservation measure in southern Sweden.

In the discussions during and after the presentation the following things were raised by the participants:

- There are many good examples of private forest owners that have collaborated over estate boundaries in activities that are positive for environmental values (this was raised by Per Petersson, Bo Hultgren, Jan Lannér), such as restoring pastures. A positive side effect of such activities is strengthened social bounds among neighboring owners, i.e. the conservation project also becomes a social project.

- According to Per Petersson the forest sector needs to put more efforts into increasing biodiversity, there is a lack of overarching philosophy in these issues within the forest sector, their thinking is too narrow and too much focused on profitability.
- Conservation oriented management has a great potential since many owners are interested in these measures. In association with this it was debated how large share of the private forest owners in Kronoberg that have a positive, or negative attitude towards active measures to increase the share of broadleaves.
- Anders Ekstrand stressed that many private forest owners are disappointed on excessive steering and bureaucracy from state authorities in these issues, for example when owners apply for grants for conservation oriented management measures. Mårten Västerdal said that he is aware of such concerns, and stressed that the work with green infrastructure will be different, focusing on stakeholder participation and collaboration. Anders replied that Södra look forward to working in such a way.
- Landscape level simulations are an important tool to show the long term consequences of different alternatives and look at ecosystem services on a landscape level.

3.2.5 The rest of the afternoon, Group work

The rest of the stakeholder workshop was devoted to group work. Mårten divided the participants into three different groups, each group got two questions to discuss which had been prepared by Mårten with assistance from myself and Vilis Brukas. Each group worked individually in smaller rooms with their two questions for about one hour. After this all participants gathered and reported the results of their group work, and in association with this the questions were discussed further in the big group. Following is a presentation of the six questions, and short summary of the reported answers and the subsequent discussion related to each question. It is evident that the reported answers and discussion related to a specific question did not always stick to the questions formulated (e.g. question 1-2), this can be expected in an open discussion where the addressed issues often are highly interlinked. In addition, the workshop secretary (Vilis Brukas) did only take part in the group work presentations in the full group, not in all groups' individual work. This summary should therefore be seen as an overview, not covering the discussions in detail.



Picture 5. One of the tree groups in the group work at the stakeholder workshop. Adam Felton (front left), Pelle Ström (mid-left), Helene Lantz (top left), Christin Kvennefeldt (top-center), Mårten Västerdal (top-right), Jan Lannér (front right), Pär Petersson (front-center).

Question 1

Are measures needed to increase the connectivity in the forest landscape or "is it solved by itself" with the current level of nature consideration?

It was concluded that this problem (connectivity) cannot be solved solely with more set-asides. And it would be an economic catastrophe to ban forestry everywhere in the "värdestrakterna" (which are areas appointed by the CAB that have a higher density of forests with high conservation values, and the CAB are often trying to focus conservation activities in these areas to maintain/further improve these values). More knowledge is needed regarding connectivity and related issues.

Question 2

What is the most effective strategy to increase connectivity in the forest landscape? Set-asides for conservation purposes, or a generally increased quality of the nature values in the production forest (deadwood, share of broadleaves, retention trees etc.)?

The trust towards advisor, authorities and the legislation are important. The authorities need to work more with advice and less with sticks (i.e. soft steering). It is also important to make it more clear what actually is required according to the legislation when it comes to environmental issues. Promising forest policy tools could be a trading scheme for set-asides (which would enable more coordinated efforts in a forest landscape with a fragmented ownership structure), and tax cuts for the forest area that is set-aside from forestry. The proposal by Per Petersson to implement a tax cut for the area set-aside for conservation purposes had great support among the workshop participants.

Question 3

According to the forest policy goal "More varied forestry", which is an milestone target related to the environmental target "Living forests", we need more mixed forests and more broadleaves in the future forest landscape of southern Sweden. Can this goal be achieved with the current legislation and governance system or do they need to be further developed?

The main problem, which is the main obstacle towards more varied forest management practices, is the high level of damage from browsers. Regarding forest policy tools, authorities need to work less with legislation and more with advice and economical steering. The work with green infrastructure are in line with the trend towards more intensive forestry in some areas of the landscape, and a higher proportion of set-asides in other areas (e.g. considering CABs work with concentrated efforts in the "värdetrakter").

Question 4

Three alternatives to increase the share of broadleaves were presented in the simulations (Border zones, Spruce-Birch mixture, and Oak for wood production). Do you have any opinions about these alternatives with respect to e.g. their effect, cost, and feasibility? Are there other methods that would be more effective in reducing the barrier effects of the production forests?

According to representatives from Sydved and Södra, border zones are already accepted as an important focus area among the forestry actors involved in practical forestry, Spruce-Birch mixtures and Oak for wood production are less realistic due to their lower growth and higher costs. Spruce-Birch mixtures where the species are mixed in groups, with the birches on the more moist areas can be a promising strategy according to new research findings (from the Southern Swedish Research Centre, SLU in Alnarp). When talking about more varied forest management practices it is important to not forget the problem with Scots pine, a species that is decreasing since owners are reluctant to reforest with Scots pine due to the high browsing pressure.

Question 5

What can the forestry actors do to increase the connectivity in the forest landscape? How? Are there any obstacles? Key roles?

There is new knowledge emerging all the time and therefore wood-buyers and forestry advisors needs to be educated in these issues on a regular basis. It was discussed to what extent this is done today, and who is responsible.

Question 6

Do you have any suggestions on activities/projects/efforts that should be included in the CABs continued work with Green infrastructure?

Excursions where the CAB/the SFA (or other actors) show examples on how you can combine knowledge about what is needed in a particular area (e.g. in an area with high conservation values like a "värdetrakt") with suitable measures.

3.2.6 16:00, End of the workshop

Mårten ended the workshop by thanking all participants. In connection with this I (Isak Lodin) invited all participants to the second ALTERFOR stakeholder workshop, which were organized the 3rd of October 2018 at the headquarters of our non-academic partner Södra in Växjö. Several of the participants said that these types of activities are highly useful, stressing that they enable actors with different interests to exchange viewpoints/thoughts, as well as having informed discussions about different future alternatives in the light of simulations that examine the their long term consequences.

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 one week after the workshop Mårten sent out the workshop minutes, together with a short online workshop evaluation, to all participants. A few days later he also sent two of the three PowerPoint presentations to all participants (not the presentation by Per Pettersson). All the workshop participants received a formal invitation to the second stakeholder workshop by e-mail from Anders Ekstrand, as well as a remainder when the second workshop were approaching. Among the participants in this workshop nine persons also participated in the stakeholder workshop at Södras headquarters the 3rd of October (Jan Lannér, Per Petersson, Mattias Magnusson, Anders Ekstrand, Thomas Höijer, Ljusk-Ola Eriksson, Vilis Brukas, Pär Fornling and myself).

As described in section 3.2.3 the retention of border zones resulted in a big increase in the volume share of valuable broadleaves compared with the simulation with current FMMs. At the workshop I said that these results seems unrealistic since the tree species distribution in the border zones seems to be similar to the rest of the forest, and that more detailed studies are needed. Accordingly, myself and Ljusk-Ola Eriksson investigated this issue further and found that the border zones actually differ from the rest of the forest, having much higher volumes of especially noble broadleaves. Considering this, the results presented at the workshop can be regarded as realistic. We informed Mårten Västerdal about the results of our investigation in June 2018.

The intention of the Swedish ALTERFOR team was, and still is, to nurture the new relationship that has been established with CAB Kronoberg also in the future. I (Isak Lodin) therefore volunteered to participate in additional activities with local stakeholders in the Helgeå catchment that Mårten intended to arrange during the summer/autumn 2018. At this moment (October, 2018), no activities have yet been scheduled.

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 3), that was published on the department homepage the 31th of May and on skogssverige.se a few days later (4 June). 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 total 11 out of the 19 participants responded to the online workshop evaluation. The survey included two multiple choice questions and three open ended questions. A vast majority (70 %) answered that the number of participants was good considering the purpose and format of the workshop, and all answered that the group size in the group work was good. The answers to the qualitative questions were overall positive, several respondents mentioned the group work and the subsequent discussions and/or Per Petersson’s presentation as the highlight of the day. In the two questions where the respondents could provide suggestions for improvement the answers were diverging and will not be described in full length here, the most reoccurring theme was that there should have been more time available for discussion and the presentations of the group work. In line with the workshop evaluation a lesson learned was therefore to give more room for discussion by starting a bit earlier or reduce the share of PowerPoint presentation. The second workshop therefore started one hour earlier, and the entire afternoon was devoted to group work and discussions.

The workshop went well as it instigated fruitful and pertinent discussions, despite of strong and widely differing interests of the participating actors. Compared to the second stakeholder workshop there was much more discussion and debate, which probably can be explained by the broader range of stakeholders and interests represented. In our judgement, the tactics to shift the responsibility of hosting the workshop from scientists to the CAB worked out very well. It contribute to strengthening the local actor network and also fitted very well into the ongoing work with the action plan for green infrastructure in the county. In this way, we maximized the possibility to bring our scientific work closer to practice and raised the possibility of their long-term implementation. Considering that the CAB has substantial power resources in nature conservation (Juerges et al., 2017), our collaboration in organizing the workshop is also in line with the ideas of the RIU-model, which stresses the importance of finding powerful allies to facilitate the implementation of science into practice (Böcher and Krott, 2017). The future consequences of our efforts will however, to a high extent depend on (i) the political emphasis, and the financial support that will be given to the work with green infrastructures in Sweden in coming years; (ii) the staff turnover at the country boards; unfortunately, the current process leader for green infrastructure (the only person at the CAB Kronoberg we been in contact with) might leave the CAB in the near future, which potentially can make any future collaboration a bit more complicated.

Finally, working closely with stakeholders and trying to align the ALTERFOR project with CABs ongoing project did require a great deal of flexibility, and extra work, from the researchers that were involved in preparing the simulations for the workshop. More specifically this refers to the fact that some of the aFMMs that already been developed and described within ALTERFOR Work Package 1 (selection system with spruce, and shelterwood pine), did not obtain much interest from Mårten at our planning meeting. This meant that a totally new aFMM, “border zones with/without management” had to be described and incorporated into the landscape level simulations quite late in the preparation process (an aFMM that was quite demanding to implement in the simulations). The other factor that made the work a bit more stressful was the decision to have the workshop already in May, to enable the CAB to potentially use our results in the simulations. In any case, and considering a good end result, the extra efforts were well invested.

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**Produktionsskogen som spridningsstråk och barriär
Workshop inom Grön infrastruktur 8 maj 2018**

Grön infrastruktur definieras av Naturvårdsverket som *nätverk av natur som bidrar till fungerande livsmiljöer för växter och djur och till människors välbefinnande*. Målet med länsstyrelsernas arbete med regionala handlingsplaner för grön infrastruktur är bland annat att föreslå åtgärder som syftar till att bevara och stärka dessa nätverk, vilket innebär att den generella hänsynen och skötseln av produktionsskogen är av avgörande betydelse. Detta väcker en del viktiga frågor så som: Behövs åtgärder för att utveckla produktionsskogens kvalitet som stödhabitat och spridningsstråk? Kan sådan göras utan betydande förluster av produktionsvärden? Hur ska skötseln av produktionsskogen avspeglas i Länsstyrelsens regionala handlingsplan för Kronobergs län? Hur bör länsstyrelsen och viktiga skogliga aktörer samarbeta kring frågorna? Hur kan de skogliga aktörernas arbete med rådgivning till privata skogsägarna integreras i detta arbete?

Länsstyrelsen Kronoberg och Sveriges Lantbruksuniversitet bjuder in till en heldags workshop på IOGT-NTO huset i Växjö den 8 maj med syften att belysa de ovanstående frågorna. Följande delmoment är planerade inom workshopen:

- **Skogliga perspektiv på grön infrastruktur i Kronobergs län – vart är vi, vart vill vi?** [ledd av Mårten Västerdal, Länsstyrelsen Kronoberg]
- **Resultat från Heureka-simuleringar med olika handlingsalternativ som utförts i Helgeåns avrinningsområde** [ledd av Isak Lodin, SLU]
- **Diskussion om handlingsalternativ och det framtida arbetet** [arbete i grupper]

Mer detaljerat program för workshopen kommer längre fram. Vi bjuder på lunch och fika under dagen. Anmäl er genom att maila eller ringa till Mårten Västerdal eller Isak Lodin.

Tid och plats: 8 maj kl 10-16. IOGT-NTO huset, Vattentorget 1, 352 34 Växjö.

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Appendix 2

Produktionsskogen som spridningsstråk och barriär

Workshop inom arbetet med Regional handlingsplan för grön infrastruktur

8 maj 2018

Länsstyrelsen Kronoberg och Sveriges Lantbruksuniversitet bjuder in till en heldags workshop på IOGT-NTO huset i Växjö den 8 maj med syftet att belysa produktionsskogens roll i landskapet.

Program:

10.00 – 10.15 Kaffe och presentationsrunda

10.15 – 11.00 Skogliga perspektiv på grön infrastruktur i Kronobergs län – vart är vi, vart vill vi?
(Mårten Västerdal, Länsstyrelsen)

11.00 – 12.00 Resultatet av Heurekasimuleringar av framtidens produktionsskogar (Isak Lodin, SLU)

12.00 – 13.00 Lunch på Fyra krogar

13.00 – 13.30 Forts. Resultatet av Heurekasimuleringar...

13.30 – 13.40 Frågor

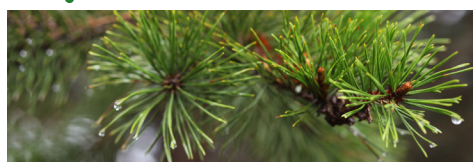
13.40 – 14.10 Exempel på riktade insatser för förbättrad konnektivitet i skogslandskapet (Per Petersson, skogskonsult)

14.15 – 15.30 Kaffe + diskussion i grupper.

15.30 – 16.00 Sammanfattande diskussion.

Välkomna!





Skog Alnarp



Visar vägval mot framtida skogar

Att förutse tillväxten i skogen ger bara en dimension av framtiden. Frågan är hur skogsägarna agerar och vilka framtida utmaningar skogsbruket har att möta. Forskarna arbetar med nya verktyg för att underlätta planering och vägval.

Nyligen medverkade forskare från Lantbruksuniversitetet vid en workshop i Växjö som samordnats av Länsstyrelsen och inkluderade många intressenter från det praktiska skogsbruket. Det handlade om möjligheten att planera för en "grön infrastruktur" som binder ihop naturvärden i landskapet.

TILL HÖSTEN hålls ett liknande möte tillsammans med Södra med fokus på produktionsfrågor.

– Vi kan inte bara sitta i vår kammare och teoretisera. Kunskapen behöver komma ut, samtidigt lär vi oss av de som arbetar praktiskt med frågorna. Det är viktigt att olika intressen kring skogen diskuteras på ett sakligt sätt, utan att sitta kvar i gamla skyttegravar. Vi tar fram underlag för diskussioner om framtiden.

Det säger Vilis Brukas. Tillsammans med professor Ljusk-Ola Eriksson leder han Alterfor, ett EU-finansierat forskningsprojekt som involverar tio länder.

ALTERFOR står för "Alternative models and robust decision-making for future forest management".

Den långa titeln handlar i korthet om att förutse vad som kommer hända i skogen

under framtida klimat- och marknads-scenarier.

– Målet är att hitta skötselalternativ på bestånds och landskapsnivå, som tillsammans balanserar tillgången på olika ekosystemtjänster från skogen, säger Isak Lodin, doktorand som leder den svenska fallstudien inom Alterfor.

VARJE land har valt ut ett område där man går på djupet. De svenska forskarna har valt Kronobergs län.

– Där finns väldigt många privata skogsägare. För att bättre förstå framtiden behöver vi också förstå hur dessa agerar. Ingen är den andre riktigt lik. Vi måste alltså också fånga upp mjuka värden, säger Isak Lodin.

Med utgångspunkt från tidigare forskning har han delat in dem i fem olika kategorier. Ägarnas beteendeprofiler har sedan preciserats med hjälp av intervjuer med skogsägare och rådgivare. Så i stället för att anta att alla beter sig lika, vilket vanligtvis görs i skogliga simuleringar, tar man hänsyn till mångfalden i ägandet.

Resultaten vägs in i Heureka, som är det dominerande beslutsstödsystemet inom skogsbruket.

I VÄXJÖ presenterades olika handlingsalternativ för

Helgeåns avrinningsområde i Kronoberg län. Utgångspunkten är att avverkningsarna ökar med 16 procent under det kommande seklet och att skogen växer bättre i ett framtida varmare klimat. Virkesförrådet ökar trots en relativt hög avverkning.

– Om dagens trender fortsätter, kommer framtidens skogar blir tätare och mörkare med mer gran. Det påverkar exempelvis markförloran med blåbärsris negativt. Man kan säga det ökande virkesförrådet ger utrymme för olika åtgärder för miljön, säger Isak Lodin.

En möjlighet i de framtidsscenarier som tagits fram är att etablera ekskog på delar



Doktorand Isak Lodin arbetar med Alterfor.

av de bördigaste markerna och skapa blandskogar med björk och gran genom förändrade röjnings och gallringsprogram.

Diskussionerna i Växjö kretsade mycket kring problemen med betesskador, tall och hur skogsägarna kan engageras på ett positivt sätt, utan överdrivet styrande.

– Några färdiga svar levereras inte, vilket inte heller är meningen. Våra resultat kommer förhoppningsvis användas i det framtida arbetet med grön infrastruktur, och således inte bara förbli akademiska övningar, säger Isak Lodin.



Vilis Brukas (ovan) vetenskaplig ledare för Alterfor.

Mårten Västerdal (th), länsstyrelsen, begrunder resultaten från projektet.



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