DESIGNING FOR DECAY
ALTERNATIVE METHODS AND TOOLS FOR NATURE CONSERVATION
Designing for decay

Thesis

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SEASON of mists and mellow fruitfulness,
Close bosom-friend of the maturing sun;
Conspiring with him how to load and bless
With fruit the vines that round the thatch-eyes run;
To bend with apples the moss’ed cottage-trees,
And fill all fruit with ripeness to the core;
To swell the gourd, and plump the hazel shells
With a sweet kernel; to set budding more,
And still more, later flowers for the bees,
Until they think warm days will never cease,
For Summer has o’er-brimm’d their clammy cells.

John Keats

Working with decay and a young forest I have stayed away from the romantic relationship to nature.
But still I appreciate John Keats Ode to Autumn, the season being so tightly associated with decay. He describes the early autumn when almost all plants prepare to hibernate and there is plenty of nutrients for fungi.
Abstract
In this thesis I describe proposals designed to give remaining species a temporary haven until their natural habitat is reestablished. Designing for decay is about alternative methods for nature conservation, about us working with the forest not against it. Methods based on decaying wood and the reintroduction of fungi into the young boreal forest. Looking at the planetary boundaries as summarized by Stockholm resilience center biosphere integrity is one of the areas where the anthropogenic factors has made the largest impact.

Key words
Alternative forestry, ecosophical design, extinction debt, nature conservatism and designing for more than humans.
What to do with this young forest?
Designing for decay is design driven explorations into how we can reset some of the damage we have done in the boreal forests. How to give credit enough for survival to the species in extinction debt. This thesis is also about how a designer can work site specific with more than human stakeholders. I have focused on young forests in the boreal zone, this is where we live and a lot of the forest could be considered to be young. The reason to strive for decay is that in a young forest the delivery time for dead and dying trees is too long for the species that are dependent on decay in their habitat. During the project that this thesis is about I wanted to investigate how I can work with design within the field of nature conservation, designing for more than humans and site specific. Today most nature conservation is done according to methods and rules inherited from the forest industry. Trees are cleared and usually with the intent to make it look pretty. Both my proposals described in the thesis is about creating habitat temporarily while waiting for the site to do it by itself. One of the proposals is to replace actions done by arborists and chainsaws with microorganisms. Working together with fungi and the trees. The second proposal is a version of the deadwood left by conservationists today, but shaped to communicate clearly that some sort of action has been made. And possibly to have a better function. My intention is to explore the possibilities of a product used to reintroduce species of fungi into the forest. This project is site specific but the learnings could be used on other sites. Knowing the site will be crucial wherever you chose to work. It is also a proposal of new ways to think of the forest and how we can coexist with all species. I wish to explore methods of nature conservation to be used by humans but based on methods nature would use to achieve the same results. The methods of clear cutting a forest is an effective way to quickly get access to large amounts of biomass. In an industrial context this was rational, to optimize efficiency and quickly plant new trees. One problem with clear cutting is that the trees are an important part of a circularity, the biomass should not be removed from the forest, it is needed in the ecosystem. When removing large amounts of biomass we also destroy the habitat for several species, my project is about creating this habitat during the period of transformation in a young forest until the forest can deliver these habitats by itself. One thing that happens after a forest is cleared is that a lot of the ectomycorrhizal fungi that lived in symbiosis with the trees will die. Part of my design is reintroducing the symbionts that was lost when the forest was replaced with a tree plantation.
During other projects I have worked with ecologies, searching for a greater understanding of other than humans and their needs. I have also made several explorative journeys into the forest industry, trying to decode the different ways to put value into the trees. Sweden is a land covered mostly by trees and in my family most of my ancestors worked in the forest industry, and almost by accident I became a forest owner a few years ago. The land that I own is very dear to me and is becoming more than just a patch of land to build a house on. I also explore the relationship to earth through my own land. My interest in the eco systems of the boreal forest and designing for the micro organisms residing in the soil beneath the trees has grown over time. Designing for these species is a challenge that I gladly accept. My work has in the past zoomed in on different parts of nature, in my bachelor project I worked with cyanobacteria and a way to use it to harvest fertilizer out of the baltic sea. In other projects I have used artifacts made out of wood to create conversation pieces and maybe to provoke. During the last ten years I have noticed that the societal view of the forest has changed, books like Granskogsfolk by David Thurfjell but also Ålevangeliet by Patrik Svensson indicates a almost religious interest for nature that is developing into something that allows itself to question the traditional methods of forestry and the industrial supremacy that for the last two hundred years has ruled in decisions regarding nature. In sweden there has been an interest and love for the forest for a long time but I sense a shift in how this is practiced. Could it be that we are mowing from a romantic view on the forest towards a educated relationship? My intention is to explore the possibilities of a product used to reintroduce species of fungi into the forest. An alternative way to work with nature conservatism. The reasons to do so are many but I will focus on symbiosis and decay. Working specifically with one site to be able to focus on the needs of that specific ecosystem. The products could in a possible future be adapted too and used at other sites. I will work with decay, fungi, wood and a specific site. I will try to approach this subject with care and carefully, some of the decisions I make might affect some of the stakeholders a lot but could easily be forgotten by me. What is not done will not need to be undone but what is done wrong can’t be undone. All decisions is given time and the smaller actions is prefered.

“I have read many definitions of what is a conservationist, and written not a few myself, but I suspect that the best one is written not with a pen, but with an axe. It is a matter of what a man thinks about while chopping, or while deciding what to chop. A conservationist is one who is humbly aware that with each stroke he is writing his signature on the face of his land.”
Aldo Leopold - A sand County Almanac (written a birchs life ago).11

The writings of Aldo Leopold might be dated in some parts but the quote makes according to me an important point. Whoever swings the axe that is defining what conservationism is, must be on the site, the subject of the conservation. To decide on actions one must know the site and consider the properties of the site. But you should also know the result of your actions and what they will result in when acting in forest time, what will the swinging of the axe today result in 200 years from now?
Decay
Designing for decay is the title that stuck with me. Planned obsolescence, planned decay, designing a product to not last long but to redistribute its nutrients to others in need. Decaying material is one of the main nutrients in the ecosystems of the boreal forest. It is also an important habitat to thousands of species. Today the forest industry bring what could decay out of the forest and sell as paper and wood products.
A cubic meter of dead wood can contain over 200 species of saprophytic fungi, large amounts of insects and microorganisms. The decaying function was central in the project from the start and it also played an important role in the formgiving. Many of the guidelines or the box of rules that I wrote based on what I wanted to achieve at the site was written to optimize decay.
To invite decomposing organisms. The decomposition is important to release the nutrients from the dead tree and make it available to ectomycorrhizal fungi that will deliver it to younger trees. When bringing too much material out of the forest there is less left to decay, then we have to bring industrial fertilizer/nutrients to the trees. The fertilizer also makes nutrients accessible that the trees normally needs a fungal symbiont to access. Using fertilizer in a forest will decrease the amount of mycorrhiza and the soil will become dense and eventually die.²
I have slowly started to like decay a lot more as my understanding of its importance has grown. Initially we might think of decay as something following death, only seeing the decaying individual. When knowing some of the life connected to decay and the life it gives when nutrients are redistributed it becomes something beautiful. Decay is the recycling station where nutrients carefully are taken care of and what used to be tree or a fox slowly become soil again.
How can I design for more than humans?
And maybe for humans at the same time?
During this project I worked a lot with the subject of symbiosis and with a focus on the soil. And who/what lives in the soil. Both working with ectomycorrhizal fungi and decaying wood in the surroundings of the ectomycorrhiza. I have tried to create a product that both will work as a reset button in degraded soil but that also could be an educational and communicative product for humans.
A product that creates a habitat that the young forest can't deliver by itself yet. Entering the site as a designer, working with the methods of the designer and parts of the knowledge borrowed from an ecologist.
I did not want to exclude the possibility that the end product could look as a human was my primary stakeholder. I think it is important that I try to communicate with humans through the project. There was also a ambition that the end result could be developed into something with commercial potential.
I also wanted to explore a language that to a larger extent emphasizes relationships, togetherness, connectedness and a ecosophical understanding of our coexistence.
I usually start a project with tentacles extending in every direction, reaching for hard to reach places but also searching in familiar soil, trying to grab anything that could be nutrition for thoughts or a guiding light in a new direction.
Exploring the ecological literacy. And the language ecologies are spoken in.
When working with one or more specific sites I want to view these sites and their habitants and more temporary stakeholders as my target group.
Putting my spotlight on the site through empathy and studies on site.
I wanted to use material that could or should be found on the site. Material that once was native to the site and if reintroduced would benefit the site.
The objects I am working with could also be seen as sculptural objects, functional for the site but for the human viewer primarily sculptural or communicative.
Shapes to awaken curiosity, for humans to wonder what actions have taken place at the site. I have tried to work with designing for the site and the habitants but in the gestaltung working with humans in mind.
All material I work with will have a function for the microorganisms, plants and animals living on the site or regularly passing through. The humans visiting will be able to enjoy and read the objects through their shape rather than their function.
A product that gives to the soil that it partly was built from.
A gift to the ground, a treat to the soil and a way to experience closeness and togetherness.
Methods used when restoring the boreal forest

Anthropic degradation of the soil is one problem that modern forestry methods cause. The amount of dead wood in a forest will also determine the biodiversity and the amount of nutrients available for coming generations of trees\(^3\). Deadwoodology is a term used to describe the ecologies of dead wood. When the forest also is farmland, large fields of trees with the purpose of becoming paper, construction material and maybe firewood, not enough wood is left on the ground to decay.

Even in the recreational forest most human visitors prefer a tidy forest, without too much dead wood forming a chaotic pattern on the forest floor.

When interviewing both arborists and regional ecologists working with these questions they both mentioned that whatever action taken needed to be visual also.

One of the larger arborist companies mentioned that making it pretty was extra important when working on a short term contract that was up for renewal.

Looking at early biblical nature conservatism, maybe the greatest thing Noah did when building his ark was using wood, I can imagine the 300 cubits (150 meters) long vessel being left as a gift of dead wood to the drying land after the flooding.

The amount of fungi and organisms living in the wood must have been larger than the number of ”every beast after its kind, all cattle after their kind, every creeping thing that creeps on the earth after its kind, and every bird after its kind” combined.\(^4\)

To leave some dead wood in the forest is a method used today in nature conservation.\(^5\)

A cubic meter of dead wood is usually host to more than 200 species of saphrotopic fungi.

The ark must have been at least 6700 cubic meters of dead wood, calculating on a hull thickness of 30 cm not including the interior details.
Leaving dead wood in the forest is one way to improve conditions for saprophytic fungi which eventually will improve conditions for the ectomycorrhizal fungi (EMF). To invite EMF back into a forest is usually done by adding substrate with mycelium to the soil. If there is a suitable symbiont they will connect. Mycelium could also be grafted into the tree, close to the roots.

Trees living in mutualistic relationships with EMF can be harvested in many ways without destroying the fungal part of that relationship. Only when clearcutting the forest, killing all symbionts the mycorrhiza will die with the trees. By reintroducing EMF with the plants also a clearcut forest could have a rich soil once again.

John A Stanturf described it in a review on methods of contemporary forest restoration. "One of the key factors necessary to restore eroded soils is to reactivate microbial activity. Many eroded soils have lost the topsoil, in which most microbial activity occurs, so for mycorrhizal plant hosts it is common to find low level of mycorrhizal infectivity. To restore this mycorrhizal activity, nursery inoculation of EMF species that tolerate the harsh conditions of eroded soils has proven to be effective".

In temperate and boreal forests up to 95 percent of the plants are symbionts with EMF. The fungi provide nutrients and water in exchange for carbon that the plant supplies. The fungal underground network in an old growth forest boost the growth and helps the trees gain volume faster. One especially interesting detail with the collaboration is how most of the carbon absorbed by the tree actually is stored by the hyphae, only about 30 percent is stored in the wood.

I believe that it is important to also set a reasonable goal, to make good and to improve the conditions but also realize that a complete restoration is not possible. "It is generally impossible to recreate ecosystem conditions that existed prior to anthropic or natural disturbance because of local extinctions, shifts in climate conditions, or other irreversible changes in conditions. Thus, many restorations focus on restoring specific ecosystem functions, particularly in a context of rapid climate and land use changes".
Design methods I have used when collaborating with a site
It is important to approach a site carefully, to observe all stakeholders with care and without a hurry, some stakeholders might be invisible for a long time. The stakeholder mapping is the foundation on which other methods used later on will rest. If the mapping is not done correctly the foundation will collapse under the weight of the later work.

One method I have used is empathic design, both during the stakeholder mapping and also when moving into a phase of understanding the needs of the site. User centered design methods adapted to more than humans worked well for me. By first observing, trying to understand the site and finally trying to understand the needs of the site and defining those needs before starting to prototype. The empathic design method being the one I found the most useful as it is about understanding the needs of a specific someone else. In my case this specific someone else is of several other species.

During the project I have ranked actions and possible outcomes on a desirable/possible grid to evaluate and make decisions. Empathic design methods combined with ecological knowledge and the observations of the site has been very helpful, trying to listen to the site as much as possible and sometimes I tried to be the site.

I also analyzed the site with the help of the haptic toolkit. After sensing the site using haptics and one haptic attribute at the time I added this to my earlier work on the site. This was more useful for the planned exhibition than the product proposals I decided on.
Three sites I went thru before choosing one

My three sites are almost the same size but very different. Like almost all land in Sweden they have historically been forested, and in some ways they still act as hosts to plants. The difference between the sites are value, how value is measured, closeness to urbanity, degree of anthropocentric degradation and the kind of stakeholders. Working with different sites was a good exercise in the beginning of the project as it made me realize how important the site specific the knowledge could be. It was also rewarding to spend time at the different sites, somehow my ability to observe and listen to the site was honed during these first weeks. After spending a lot of time at the sites I decided to work with Brunnsta where I could also prototype my proposals and experiment. The two reasons that made me choose Brunnsta is that it is very similar to my own land and that the farmer owning it allowed me to experiment on his land.

Smutsgrönt in Västberga

A site squeezed in between intense urbanity and infrastructural giants. Below Nybodakoppel and close to Västberga allé. The green space that no one cares for, a place that might come in handy if you want to do something shady. At Smutsgrönt some people will dump their trash. The site is valued in urban planning for its capacity to handle rainwater. But for most of us these green patches in between the rest of the urban environment doesn’t really have a value. It will never be a place for rekreation and only the most hardcore urban gardeners will try to cultivate. For some of the companion species in our society these patches of vegetation is of higher value. A possible hideout for animals living close to the populated areas. I think that an area like Smustgrönt could be a very interesting place to create habitat and to develop a method to refine the green wedges along urban infrastructure.

Ulriksdals naturreservat

A royal park, land owned partly by the royal family and partly by Solna municipality. Valued by high natural values, location and its heritage. This is in some ways the most delicate of the three sites and its purpose is for me to get a deeper knowledge of the methods of nature conservation used on highly valued land. When getting to know Ulriksdal I spoke to both the company working with nature conservation in the area and the ecologist Veronica Gelland-Boström working for Solna. I also had the chance to discuss my design proposals with Veronica after I decided to not work with Ulriksdal. A lot of the feedback from her has been important in how I have worked with my products. At the Ulriksdal site and at Brunnsta I had the opportunity to work as a Nature Conservationist/Arborist for a few days at each site working together with the regular staff.
Brunnsta

Brunnsta is 50 kilometers north of Stockholm.

Brunnsta is a site in transition, farmland that for a long time was used to grow crops. 30 years ago the landowner planted birch. The soil was rich in clay and the land was covered with water after the latest ice age. But from hundreds of years as a monoculture the soil is now impoverished and the newly established pioneer species is birch, the land is in transformation, from rye, wheat and peas it is now becoming a forest again. From annual digging and mowing the soil around it will be now be left to transform. If the forest is allowed to grow with diversity the soil will be rich once again when a few generations of trees has passed. To begin with the Birch is taking control of the place and also a small number of spruce is sneaking in.

The birch is not that sensitive, it will slowly establish itself without a fully grown network of mycelium. But the site would benefit from biodiversity and a living topsoil. Brown birch bolete or Fly agaric will probably be one of the first symbionts to return to the site. For the mycorrhizal network to reestablish itself there needs to be spores in the soil that is activated by the roots. After the pioneer species is established they will need fungal symbionts to grow to the potential of the sites carrying capacity. One thing that is missing when land is in transformation back into a forest is dead wood and when the goal is to harvest timber it is not very likely that there will be that much of dead wood. It is on the needs of this site I have based my proposals.
3.4 The rules
Together with the Brunnsta site and its residents I have written a set of rules. At least I think that I have listened to the needs of the site and its more than human residents. One need is more dead wood and more fungal decomposers, in the young forest the trees are healthy and there is a The rules was created by using a list of possible properties that could be less or more desirable. By ranking the properties and also looking into what effect they could have on each other I ended up with a list of “must haves” and “nice to have”. From this I

1. My actions on the site should prioritize the needs of the site
2. Create a variety of decay, the more invited decomposers the better
3. Use material from the site as much as possible
4. When adding species only use species that could be native to the site
5. Do as little as possible
6. Don’t forget the fox (and other vertebrates)
7. The methods used should also have commercial potential, at least in theory
8. Decay is a must
9. Do not introduce invasive species
10. Communicate with humans thru gestaltung but not by compromising on the more than human properties of the product
4 The proposals
In my final proposals I have chosen to only work with one of the sites, it is the site that represents a large part of the land in Sweden. Brunnsta is in many ways a representative for the anthropically degenerated land that covers a large part of the northern hemisphere.
Generations of farming monocultures or clearcutting trees has left the soil in poor shape. My two proposals is products benefitting the site in general but more specifically types of mushroom that I would like to reintroduce/strengthen.
One proposal is a box of possibilities added to the site and then a passive waiting for the site to welcome my proposal. The other product is containing mycelium that I wish to reintroduce at the site, the properties of the introduced mycelium is tied to a symbol.
They both require a more active approach in the beginning and then passive, leaving the site alone. Both proposals are designed to reintroduce habitat to the site but in different ways. When working with these products I tried to act in relation to the rules I created and also reevaluating the rules as the process went further.
“House”
Is what I call the first product, a product that also could be called a service, it is an object built on the site to create a haven for saphrotopic fungi. A massive structure of wood, preferably different species of wood and constructed to offer a variety of properties and diversity of conditions to befriend as many new habitants as possible.
A cubic meter of life-giving wood shaped to save moist in some parts and to be dry in other, to give both shade and sun exposure. The massive size also creates a microclimate that a single logg of a smaller size cannot achieve.
Shaped to be seen by humans and to be a home for hundreds of fungi, insects, bacteria and other organisms finding the cube to become their new home.
A pile of dead wood is a common action done by nature conservatists, what I want to add with my proposal is both a communicative dimension and a functional improvement, especially in a young forest where larger trees are rare. The shape is a strict geometric cube that thanks to the shape is visible in the forest.
The cube is also a reference to the cubic meter that is the unit used to describe the value of a forest.
“Play”
Is the symbol for a dowel introducing a mutualistic symbiont, a fungi that will start trading nutrients with the host tree, together they will create a network of roots and hyphae. This could be Fly agaric, Fairy cake fungi (Hebeloma) or at a later stage Brown birch bolete which is a suitable mushroom to introduce to birches at the age of 30.⁹ The symbiosis between tree and fungi is crucial to the growth and resilience of the forest. This is also important for the soil quality and resistance to climate change. This is where I like to introduce ectomycorrhizal fungi. Up to 70 percent of the carbon absorbed by a tree is stored in the mycorrhiza, if the services provided by the fungal symbiont is replaced with fertilizers a lot less carbon needs to be absorbed by each plant. The mycorrhiza trades hard to reach minerals for carbon with its symbionts.

“Pause”
Is the symbol for dowels introducing fungi that could act as both a mutualistic symbiont and a parasite depending on the condition of the tree.¹⁰ Pause could be introduced at the same time as play to create a more diverse palette of symbionts. If the tree at a later stage would be stressed by draught or damage from a storm the symbiont would change the collaboration into parasitism and start a decaying procedure. When turning into a parasite the tree will become nutrients and habitat for other species and the symbiont will seek a new mutualistic partner.
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"Stop"

Is the parasite in the crew, by grafting stop into a tree the goal is to create standing dead wood. The parasites I would like to collaborate with is slowly evolving species that doesn't spore effectively. When introducing parasites I believe that it should be done with caution. Chagga (Inonotus obliquus) is one possible symbiont that could be used as a parasite, living together with the tree for almost 20 years before turning it into standing dead wood. If harvested the chagga will be of high value to the landowner. The Play, pause and stop-symbols attached to the dowels is used to visualize the actions that is done to the tree and what it will do with the tree. If someone who knows about the system they will understand it, for those few of our fellow citizens that is not familiar with my exam work, the symbols will have a function as curious objects. For any human walking past a tree that have been grafted a reaction is possible. My wish is that the curiosity will lead to further investigations or a discussion of what it could be.

If someone talks about a tree it is good. The reasoning behind the symbols could also be applied to “house” the cube could also have a function as a curious object, it is in many ways sculptural and the strict geometric shape gives it visibility in the forest.

Early prototype for the dowel box. The bottom compartment is to store mycelium that will recharge the dowels.
System
Mycelium dowels is used to graft different symbionts into trees. The dowels are stored in orange boxes that also function as a charging station. The bottom compartment of the box is filled with substrate and mycelium. When a new set of dowels is introduced they have to sit in the box until the dowels are carrying the mycelium. The substrate needs care and to be refilled with sawdust and moisture. Caring for the mycelium might also create a closer relationship to the species that are involved in the system. When grafting the dowels into the tree a ring of beeswax is sealing the hole where the dowel went in. The different types of dowels will be stored in their own box and are not to be mixed. Several boxes could be transported in a temperature stabilizing bag. The action is easy to perform and could be done by almost anyone that can handle a powerdrill.
4.1 Gestaltung
When giving shape to the objects that should be placed in the trees or on the forest floor I struggled a lot with visibility, it is very easy to disappear among the trees. Organic shapes is easily camouflaged by a shape that is common in the forest. Especially when the materials used are sourced on the site. During this process I strived for visibility in shape without adding color. In the form-giving I also followed the rules written together with the site, decay is not to be compromised with. When I started to work with strict geometrical shapes it all became visible, straight angles is very rare in the forest.
For the larger objects I decided to work with the same shapes and conceptually with the measurement system that the forest industry uses to describe the value of a forest, the cubic meter. A strict solid cube of wood placed to invite new habitants. The cube could also be described as a curious object for the human viewer. The smaller objects, the dowels that are shaped to be placed on trees (for function see proposals) is given form inspired by the larger object but also a form that is communicative. The dowel head is designed to communicate what action is taken and what function they have. Play, pause and stop symbols borrowed from the cassette player. Symbols that easily survived the transformation from analog to digital is now transformed from flat graphic symbols printed on consumer electronics to three dimensional objects grafted into trees. The symbols needs to be readable until the function is visible on the tree.
What will happen if you turn them 90 degrees clockwise? Working with a limited number of symbols, this will not become a problem in real life. They will be recognizable even if twisted, a reader familiar with the symbols within this context will be able to read the signs from all angles. If you are a total stranger to the symbols when placed in a forest they will serve as a curious object, inviting the viewer to think about what might have been done to the tree.

The symbols for play, pause and stop survived the transition from analog mechanical controls to touch screens and digital players. I think they also could work in the forest as symbols of an ecological, circular player.
Appendix

Building the exhibition in the basement of Konstfack was a fantastic adventure. Regular visits back to my sites to gather material and to do the last adjustments to the proportions of “Play, Pause and Stop”. All happening while doing long hours building in the basement and working together with Alice and Laslo that I shared the room with. Being placed in the basement was a wish I had, working with species of fungi and decay a lot of the work is happening underground. I also wanted the work to be shown underground. I also like the ambience we created in the basement, a good flow and a foresty scent. On the opening day of the exhibition I tried to watch how visitors viewed and understood my work I also had shorter conversations with about 50 people.

Most of the people that stopped at my part of the exhibition started with reading the descriptive text for the “play” symbiont and many also read at least one of the other texts. The visitors that I talked to seemed interested in the project and I also think that the information was balanced and contained the key elements needed. Most visitors understood the important parts of my project after looking at it for 2-4 minutes. On Saturday 21st of may when th exhibition opened 1100 visitors entered thru the basement door and I estimate that a third of the visitors entering stopped and stayed at my part of the exhibition for at least 30 seconds. There was about 1400 people entering the building from the main entrance and it was harder to know how many of those that went into the basement.

I think that the reorientation done by Curatorlab was a very good idea but the orientation was based on everyone entering thru the basement, I think that it could have been even more effective if it also included a plan for those that did not walk along the planned one way flow thru the building.
Feedback from my presentation at the exhibition combined with the conversations I had with the visitors also made me realize how important some information in the box for the dowels might be. The properties and some instructions should be included in the packaging. Building and opening the exhibition also refueled me and I found new energy to develop this project further. The first step in developing my concept will be a collaboration with the farmer that owns the Brunnsta farm. In this first step I will graft dowels with the chagga parasite into birches at the site that I have worked with. There is also a possibility to collaborate with a company that are interested in buying the chagga if it is harvested.

I will also try to introduce the cubic meter of dead wood to the nature conservation companies that I worked with and interviewed during the project. I believe that a standardized wood pile could be a product that buyers of nature conservation would appreciate, it becomes visible what actions have been done and it could also be a way to make the deadwood easily quantified in cubic meters.

I also have plans on developing all parts of the project on my own land, to continue working with my own land as a lab to improve biodiversity and restore the soil into what it once was. First step on my own land will be to investigate how optimized carbon storage combined with biodiversity improvements could be achieved.

I would also like to collaborate with a mycologist or ecologist in evaluation and development of the dowels, maybe we could find other properties that could be a part of the product palette. I also had the chance to present my project to Anna Ekström The minister for Education during her visit to Konstfack. This was also a good exercise in explaining the project in three minutes and with some added pressure.
References


1.1 Aldo Leopold - A sand County Almanac. 1949. Ballantine Books


Saprotrophic fungi feasting on a birch that died during the dry summer of 2018.

Dowels being charged with mycelium.