
Silvaskog
The Forestry Guide™
For profitable, stable and beautiful forests

Contents

2010 – The Forestry Guide™

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Introduction

Good forestry finances are achieved by minimising efforts and felling trees in a way that is as economically and biologically sound as possible.

All agriculture and forestry work involves benefitting from plants in a given area producing biomass in various forms with the help of solar energy and carbon dioxide in the air (CO_2). Some of the ground's nutrient resources are consumed at the same time. In our role as growers, we generate revenue by using/selling the resulting products and benefits.

It is of utmost importance that we preserve the basis for all production, in other words, the earth and its ecosystem, and do not over-consume the nutrients or destroy the ground's structure with heavy machinery.

Forestry is different from farming in that forests are found on most land without having been planted there. In Sweden, forest grows spontaneously on pretty much all land types. A field will become overgrown if we do not farm it. All our agricultural crops are planted by man and will fail to survive if not tended to on a frequent basis. Forestry spans a much longer timescale than farming, which makes it more risky to set up systems requiring great care. Forestry projects run the risk of falling into rack and ruin simply because no one is able to look after the trees for a few years. Fields have a timescale of one or a few years. Even if intensive work is carried out, the options for revitalising the forest are very limited in the long-term. Moreover, high-intensity forestry work is expensive and results in a poor return on our investments.

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A brief history of how forestry has evolved

The forestry clearing method first used in Central Europe during the first half of the 20th Century came to Scandinavia in the 1950s. In many ways, this was Sweden's very first attempt at structured forestry. It is this type of forestry that is dominant today.

Within forestry clearing, wood is seen almost as a crop, which is why forest plantations are set up and maintained; the idea being that this is rational use of the scalability that ensues. All clear-felled/unclear forestry is aimed at controlling the forest environment prior to felling. This is the ideal scenario, but is unrealistic at the same time. The problem lies with the high costs for maintenance and also the fact that the uniform and homogeneous forest created is prone to disturbance, something that was all too evident when the storm known as Gudrun blew across the country.

The high value that the created forest is expected to produce compared to natural forest is eaten up by factors such as storms, root rot, different vermin and the costs involved in counteracting the effects of these. In business terms, this kind of forestry cannot possibly cover its costs for maintenance and repair work, which makes high-intensity forestry work untenable for anyone who wants their trees to provide a good, long-term financial return. To make them financially viable, intensive forestry systems need to provide the benefit of forestry systems that work together with the natural development that is permanently ongoing in the forest.

In recent times, climate has been used as an argument for intensive forestry. However, in order to lock in carbon dioxide over a longer period of time, the forest needs to be able to grow for much longer than is currently allowed by the tree felling process. It is imperative that the negative impact forestry has on the tree population and the land be minimised in terms of damage caused by heavy machinery, ground preparation and so on.

The reason for the initiative taken to develop the Lübeck model was the reducing net crops experienced in Germany during the 1970s and 80s. Industrial plantation forestry (both clearing and continuous systems) had been used for longer there than in Sweden. After almost 60 years clearing forestry, we are now experiencing the same development in Sweden too. Increasing problems with storm felling, insects, root rot and pine stem rust attacks are recurrent in all of the cultivated forest. At the same time, maintenance costs tend to increase. Skogsstyrelsen (the Swedish Forestry Commission) statistics clearly show that the wood volume must grow continuously if the financial volume is to be maintained, in order to counterbalance the drop in profit.

Biodiversity has reduced significantly in the last 50 years because of clearing forestry, weakening the entire ecosystem of the forest to the point where its biological resistance to damage is decreasing as its exposure to risk is increasing. This is tragic in itself, but is also serious when we take issues such as climate change into consideration. Natural forests are the most complex and stable ecosystems we have, but conventional forestry places pressure on the forest itself, causing a reduction in its biological resistance to damage. This significantly increases the risk of financial setbacks caused by damage from rot, drought, insects or storm weather.

For example, tree maintenance and surgery costs in Sweden rose by 7.5% in 2009 alone (source: Skogforsk [the Forestry Research Institute of Sweden]). Furthermore, private forestry work is seen mainly as lagging behind on maintenance. However, costs would increase further if this were to be taken care of.

This shows how important it is for forestry work to not be dependent on the efforts of man or machine because it is impossible to predict how costs will develop for these. Moreover, it is obvious that any of our forestry work that does not take the forest's ecology into account will cause reduced productivity in the short or the long term. Economic and environmental concerns go hand in hand!

That's why we really should look at other forestry models and not just those that have been used traditionally.

A history of forestry and nature working hand in hand

Different varieties of "natural" forestry have been developed and put into practice since the early 1900s. These have become increasingly refined thanks to the efforts of foresters and forest economists in Central Europe. These came about as a result of the surprisingly bad financial situation of maintenance-heavy forestry – an industry often ravaged by enormous problems caused by disease and damage to the forest plantations.

The first plans for forestry and the forest's natural systems working together in harmony had already been laid out by the 1920s in Germany, with the book "Dauer Wald Gedanke", published by A. M Möller for purely economic reasons upon the realisation that small investments and low maintenance costs were not to be ignored.

ANW, an association of private foresters that saw the clear financial benefits of "natural" forms of forestry, was founded in the 1950s. The systems implemented were, however, static, and thus not without their own problems. This led to poor financial returns and an increasing amount of conflict with the environmental movement. At the same time, various forestry-related professions were losing their status as other industries grew in popularity.

In 1990, Lutz Fähser, a forester and doctor in forest economics, decided to develop a more 'laissez-faire' model focusing on the production of quality timber with large dimensions but low maintenance costs. In 1991-92, thorough planning was carried out for the Lübeck city forest, which was the starting point for the new management focus. From this point onwards, the work has been continuously analysed and methods refined.

The Lübeck model is based on the assumption that nature knows best about how a forest should be composed and structured. Nature utilises every ecological niche, guaranteeing sustainable production.

One of the principles states that a flourishing forest ecosystem is a prerequisite to achieving a good financial return in the long term. It is also a well-known fact that natural forests are better able to cope with damage than planted forests, and that the quality of timber from natural forests is unbeatable. By applying their knowledge of the subject, foresters can then work together with their forest and continually harvest the surplus produced by the forest itself.

Forests manipulated using conventional forestry methods are converted with the Lübeck model into a more natural state via thinning and rehabilitation measures to provide favourable conditions for natural structures and species that are part of the natural type of vegetation. In forests with a well-balanced structure and good species composition, the forestry work carried out has minimal effect on the forest.

Well-documented field data from forests of this kind demonstrate that any forest that can look after itself will spontaneously steer growth towards the trees that are in the best position to deal with competition from neighbouring trees. This is also positive from a financial perspective.

The forest is primarily allowed to make its own adjustments to the species composition and structure as the stock of timber is built up. The more timber still standing in the forest, the higher the value of the production. Thinning for example, provides favourable conditions for tree specimens of particular interest in terms of timber quality. Thinning measures are aimed at trees in the stock's top layer, which is where the measures will have the maximum positive effect on the stock's future development, and, furthermore, will give a better net return. Clearing smaller trees underneath etc. is not done unless this is required for rackways, for instance.

Trees are felled once they have greater dimensions, ensuring lower handling costs and better payment. The proportion of timber among the felled area will be high, with the value of the felled stock also high. This means that you can get the same financial result as with other forestry methods, even though you are felling a smaller volume.

The forest is rehabilitated naturally without the need for ground clearing measures. If planting is still carried out, the planting material used will be as indigenous as possible.

Bear in mind that forestry based on the Lübeck model is not exploitative. The model is forward-looking and aimed at good returns in the long term.

Respecting nature and protected areas

Managed forests will always have a different appearance to unmanaged forests. This also applies to forests that are managed using the Lübeck model. One obvious difference is that the amount of deadwood is less in the managed forest as a result of the timber being felled. For this reason, it is necessary to have areas fully exempt from forestry so that the entire biological diversity can be preserved. In the Lübeck model, the unmanaged areas are very important as reference areas. The forest and its evolvement are studied, which in turn increases our knowledge of the subject.

The basic concept behind the Lübeck model is that the managed forest will be as similar to the unmanaged forest as possible, both in its species composition and its structure. Moreover, we always look for ways to minimise our maintenance work, which means that the forest can as far as possible be developed "in its own way". The term "natural forest" is not something rooted in the past – studies of how existing unmanaged forests evolve are in fact ongoing. In turn, future climate change will be dealt with naturally by the ecosystem, something it has done many times before. It is of course important to have the option of studying forests that have been as untouched as possible by forestry over a long period of time, but also interesting to study how previously managed forests evolve after the maintenance work finishes. Even if, for example, one species has vanished from the forest, the forest does not cease to evolve naturally as soon as we stop influencing it with maintenance work. This is the case even when previous maintenance work has left permanent marks. For many smaller foresters, it can be difficult to find suitable reference areas that are big enough to not be affected by surrounding forests to too large an extent. Nearby nature reserves may well be taken advantage of as reference areas in this case.

The size of areas requiring protection from forestry is a much debated topic. The size of the protected areas required to manage the biological diversity depends on the extent to which nature and natural processes are found within the managed area. In other words, how we manage the area of forest. Our task as foresters is to use the production areas in a way that takes nature into consideration as much as possible.

This is also required in order to avoid jeopardising the forest's long-term production capacity. If we succeed in doing this, the areas requiring protection will decrease in size. Managed areas will never completely replace the protected areas when it comes to preservation of diversity. The simple fact of the matter is that certain species and processes in the forest are reliant on areas that are not managed at all.

The different types of reserves we work with are:

- Single trees, millennium trees, habitat trees: approx. 10% of the stock's volume of timber is allowed to grow, die and decompose in the forest.

- Smaller areas that are exempt from forestry work. Examples of these areas include: border zones to swamps, brooks, hills or flushes, small wastelands etc.

- Larger protected areas; the areas that, for various reasons, are not used and in terms of size amount to 10 % of the total area. They may, for instance, be difficult to access or have such a low production capacity that there is no point in managing them. As far as the reference area issue is concerned, it is important that the areas also include highly productive woodland so that they reflect all parts of the forest.

In any case, smaller reserves and an attention to detail are also very important for biodiversity. Great emphasis is placed on these when the surrounding managed forests are also real forests containing the majority of these species and functions.

Natural disturbances in the forest management system

When applying the Lübeck model to forest management, we make no attempts to simulate natural disturbances. The absolute majority of natural disturbances that occur in the forest are outside of our control, for example storms. In other words, they occur naturally within our maintenance system whether we like it or not. All natural disturbances are essentially random events in terms of both the time at which they occur and the related course of events. We cannot simulate these chance events, nor can we simulate the entire function of the natural disturbance, its random occurrence or the related course of events. Instead, we try to limit our influence on the forest so that the natural disturbances take effect on forests that are as natural and therefore as resilient as possible.

Working with artificial disturbances is likely to prove useful when it comes to the urgent rescue of certain species if there is insufficient space for these species within the reserved areas of unmanaged forests, or in the managed forests, to be able to regard their long-term survival as secure.

There are many examples where there has been a break in the continuity of management and maintenance by man for various reasons, and with knock-on effects. Our grazing land is an example of this, as home to many delicate species that are reliant on a certain type of management to ensure their survival. These areas are no longer managed in this way on a large scale after the economic conditions for this changed. Among the reasons for this was that these species were forced out to cultured environments due to their natural environments being reduced in size. One example is the flood plains that previously existed along many watercourses and that now no longer exist because of water regulations.

There are a small number of disturbances of which man has influenced the frequency. Fire is perhaps the best example of this. It is often pointed out that clear-felled forestry creates an environment similar to the one created by fire. This belief is actually completely misguided. Fire is different from clear-felling in a number of ways. In exactly the same way as most other disturbances, fire is often only in patches and leaves behind a large number of living trees and tree clumps. Fire does also leave a large amount of dead or dying wood in its wake, as well as the particular chemical environment the fire has just created. There has been a drastic reduction in the number of fires thanks to more effective fire fighting techniques, while at the same time not forgetting the radical changes our forests have undergone in terms of the quantity of coarse deadwood that has fallen to the ground or is still standing.

Today's forests are in most cases too young and too short on fuel to be really easy to set fire to. As far as fire in boreal forests is concerned, we would like to point out that fire is an issue to be dealt with by society in general, and is not something the individual forester can influence to any great degree. When it is in our care, we try to let the forest steer its own course without taking fire precautions. The simple fact of the matter is that the course of development of the forest, in the long-term absence of fire for whatever reason, will go down different paths. Nature is never stagnant. In other words, reintroducing fire into boreal forests is first and foremost a nature preservation issue, the importance of which cannot be questioned, yet at the same time is something that cannot be dealt with by maintenance work within the forestry industry.

Stub clearance and forest residue (GROT)

There is a strong likelihood that forests will play an increasingly important role in the supply of energy to our society in the future. However, this does not mean we should over-develop biomass. The forest's yield should be harvested in a way that is as efficient and ecological as possible. The way in which the timber is then used is a question to be answered by the links further down the processing chain. When applying the Lübeck model, it is the stemwood from living trees that we harvest from the forest's yield. Stub clearance and forest residue (GROT) are unsuitable here for a number of reasons. One of these reasons is that, seen from a nutrient perspective, GROT contains approximately two-thirds of the wood's supply of nutrients, yet makes only a small net profit when cleared. The trunk is the part of the tree that can be felled at low cost and with a small amount of work in relation to its value, nutrient content and potential use. Clearance of GROT in practice means that future growth of lucrative stemwood is substituted for clearance of GROT now.

The forest's natural production capacity has a limit that cannot be exceeded. The only influence we have is in choosing the form in which we harvest this yield.

Any arguments for increased collection of biomass by, for instance, advocating ash recycling and compensatory manuring, will involve continuous investment in resource-guzzling systems, which in turn will increase resource consumption. If there are difficulties implementing these measures in a well-balanced way, ecological risks will also come into the equation. Breaking stubble after a felling is a resource-guzzling harvesting of low-value wood that will also have a serious impact on our main production resource, the ground.

The Lübeck model

An award-winning and effective model!

During the period 1992-94, the Lübeck model, as the only forestry model in the world, gained the wholehearted support of several environmental organisations, including Greenpeace, on account of its high profitability while also managing to not deplete the forest environment in the long term. The model's basic principles mean that it can be used all over the world.

1994 - The Lübeck model is first published for the general public.

1996 – The Lübeck model wins the International Paper Industry Paper Moon award (among the organisations behind this award are SCA, Storo Enso and Södra)

1997 – Lübeck city forest, as the first German forestry administration, is certified in accordance with the German Naturland standard. Naturland's certification criteria are founded on the basic principles of the Lübeck model.

1998 – Lübeck city forest becomes FSC-certified and the first FSC-certified forest administration in Germany. Up to this point, there had been no national FSC organisation in Germany. The German FSC standard is one of the most demanding in the world.

2009 – The German Federal Ministry for the Environment declares the Lübeck model to be the best forestry model, beating the competition in terms of financial results, biodiversity and adjustment to climate change.

2010 – the Lübeck model is cited as the only good European example of sustainable forestry in the "FORESTS AND SOCIETY – RESPONDING TO GLOBAL DRIVERS OF CHANGE" report in IUFRO World Series Vol. 25.

The Lübeck model results in:

A species-rich forest that is robust and copes with damage – Continuously adjusted to climate change. Natural forests have survived severe climate change before.

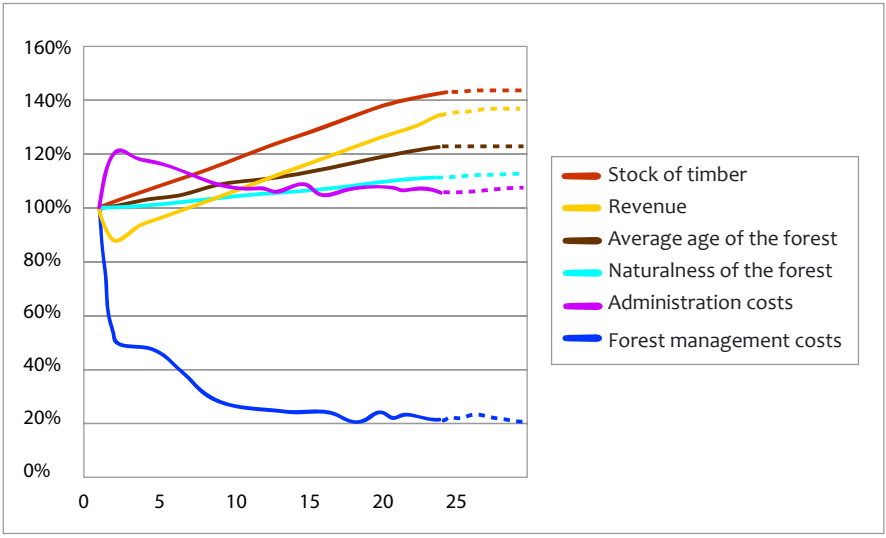
Low maintenance costs – Less money is tied up in projects, resulting in sound business for the forest owner.

Better return – Trees are selected for felling when it is more lucrative to do so, increasing the value of production for the land.

Increased flexibility – Makes it easier to adjust the land's yield to the forest owner's own financial situation and to the current state of the market.

The Lübeck model is an adaptive form of management. Limited intervention in the forest at all times – the effect of any action taken is scrutinised and future action adapted. Constant development and adjustment while minimising the risk of mistakes that are hard to put right.

Climate-friendly – The forest ties up carbon while the content of organic material increases in the land's ground; the nutrient capital under the ground is preserved. The financial value of the ground grows.



Impact of switching to the Lübeck model from conventional forestry techniques

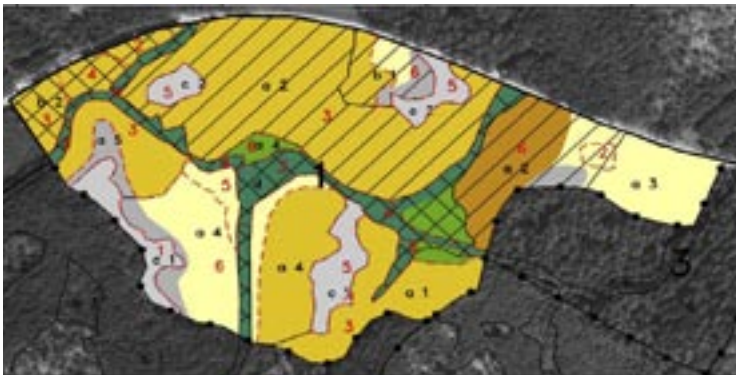
About Silvaskog

Silvaskog AB has developed services using the Lübeck model that have been adjusted to the conditions prevalent in Scandinavia.

The company is currently alone in offering Lübeck model-based forestry management services in Sweden.

Silvaskog AB offers:

- Consultation services looking at options for your land.
- Marking your next tree felling. With or without stamping duration.
- Invitation to tender for felling work in accordance with the Lübeck model.
- Forestry plans at various levels taking into account different objectives and different land sizes, plus revision of existing plans to include new proposals that fit in with the Lübeck model.



Conditions in Sweden are conducive to the application of the Lübeck model. The majority of our woodland has been more or less forested for a very long time. This has reduced the historical impact on the land in comparison with certain Central European countries such as Germany. Swedish forests consist mainly of indigenous tree species.

Since the Lübeck model is always based on the current situation of the forest, it can be applied in any forest environment without the need for a transition period – it is a case of changing direction and setting new targets.

In forests that have not been cleared or thinned for a long time, nature will have steered development in a direction that will be a good starting point for using the Lübeck model.

Why pour vast amounts of money and hours of work into planting, clearing and low thinning when a forest with a natural structure and composition will more often than not take care of this itself?

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Rev en 02-2011