

**Comments from Protect the Forest
on the European Commission's:**

Guidelines on Closer-to-Nature Forest Management

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(Brussels, 27.7.2023 SWD(2023) 284 final).

After reading the final version of guidelines for Closer-to-Nature Forest Management (CNF) from the European Commission, Protect the Forest wants to give the following comments.

Protect the Forest can state that the overall principles for CNF management, the general descriptions of the need for CNF and the state of the EU's forests usually are well formulated with solid sources. We also support the general principles of closer-to-nature forest management which, if implemented in production stands and plantations in the boreal region, would make a fundamental difference to the existing forestry and be of large benefit for biodiversity in the future. In short, the detrimental clear-cutting method has been applied as the forestry method in the boreal region in Sweden since the mid-20th century. The forest industries' ever-increasing hunger for timber for the industry has led to a state where about 60% of the Swedish forest is younger than 60 years old. Only 6% of the productive forest land is under long term formal protection. We estimate, that Sweden's remaining natural forest, near-natural forest and continuity forest, including the protected area, corresponds to less than 20%.

Unfortunately, there is contradictory and sometimes inconsistent writing in the guidelines as a whole. That is to say: parts of the regional guidelines is inconsistent with the overall guidelines, or risk opening up to interpretation that is inconsistent with the overall guidelines. This applies not least to the boreal guidelines.

Sweden harbors an important part of the EU's natural heritage. The Swedish forest landscape is diverse and contains several areas of habitat types protected under the Habitats Directive, from the Western taiga with primary- and old-growth forests and naturally regenerated continuity forests, to the Fennoscandian hemiboreal natural old broad-leaved deciduous- and beech forests. Many of these habitat types are still unprotected. The Scandinavian Mountains Green Belt, largely situated within the borders of Sweden, is a unique natural heritage from a European as well as international perspective. The unprotected forests with high conservation values in Sweden are critical to maintain biodiversity, protect ecosystem functions and contribute to climate change mitigation.

An in-depth assessment by the Swedish Forest Agency, of the environmental quality objective pertaining to forests shows an unsatisfactory ecological condition. It concludes that in recent years, despite efforts to improve the ecological status of forest ecosystems, the trend is negative. Moreover, 14 of 15 forest habitats listed under the Habitats Directive do not have a favorable conservation status, and the conservation status of 10 out of 11 woodland-living priority species of invertebrates is "bad", with the remaining one listed as "inadequate". About 2000 forest-dwelling species are red-listed. To conclude, most measures of the state of the forest ecosystem depict an alarming situation for biodiversity and ecosystem health in Sweden.

What is sustainable forestry?

According to the Helsinki resolution, SFM is: "the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems."

With this definition, it is easy to state that we in the Nordic countries today generally do not have sustainable forestry. Few people who hear about the Nordic forestry model understand how it works. It is best described as "tree-farming". Older forests are clear-cut, usually with a low-level of retention patches and trees, and often the soil is scarified. The most common regeneration method is to plant pre-grown seedlings. After a while the trees are thinned and when they are considered harvestable, the stand is clear-cut again.

Due to these negative, basic facts about the state of the Swedish forest, Protect the Forest, other non-governmental organizations and ecological researchers took part in the process to develop the CNF guidelines with high expectations. It is now with disappointment that we note that these progressive guidelines have not come to influence the standards for the boreal region in the way we expected.

An important part of the problems with the boreal region text is that the guidelines are vague, generalizing, and often sweeping. They cannot be used for forestry practices, because no clear instructions are given in terms of percentages or numbers for when different forms of logging methods should be used in order to be science-based. Furthermore, there are direct inaccuracies and directly counterproductive wording, which makes the guidelines less useful in environmental policy work. We believe that the ambition to formulate good and useful guidelines for CNF in the Nordic has been partially clouded and scrapped in favor of pressure from member countries and forest lobbyists from Sweden and Finland.

For example, an often promoted notion by forestry representatives in Sweden is that clear-cutting mimics the natural disturbances in the boreal forest. However, that notion is in no way consistent with the ecological research on the dynamics of the boreal forest. It is important that the forestry adapts to important parts of CNF's guidelines, which include the principal of learning from and permitting natural processes to develop. A forest management based on the natural processes and ecological patterns of the region should be used. Protect the Forest regrets that recognized research and other fundamentals of the situation pointed out by forest ecologists and CNF experts from the boreal region has not had a greater impact on the guidelines and led to the promotion of changes in the industrial forestry of the Nordic countries.

It is important that the CNF guidelines are applied in already managed forests. The guidelines should not be used as an excuse to manage the remaining natural and near-natural forests which are in need of long-term protection.

Finally, there is some glimmer of hope. Voices are beginning to be raised from individual forest owners and municipalities that want to switch from clearcutting forestry to CNF methods. The general debate about alternative forestry methods is ongoing and will live on. Protect the Forest also expects that the European Commission will maintain its commitment and continue to monitor the environmental issues regarding the forest of the Union, which is the reason for our reaction and comments on the final guidelines. More detailed comments can be found in this paper.

Best regards.

For Protect the Forest, Jan 2024;



Elin Götmark



Viktor Säfve



General overall comments

1. The general principles of CNF at the EU level are in some ways similar to some of those found at www.swedishforestvision.org. That appeal and vision is supported by over 60 NGOs, Sami representatives and more than 260 researchers.

General principles in Guidelines on Closer-to-Nature Forest Management:

“While forest management needs a region- and context-specific approach, building on Larsen et al. (2022)²⁰, the general principles of closer-to-nature forest management are:

- learning from and permitting natural processes to develop;
- maintaining the heterogeneity and complexity of forest structures and patterns;
- integrating forest functions at different spatial scales;
- using a variety of silvicultural systems based on natural disturbance patterns of the region;
- low-impact timber harvesting with equal attention being paid to what is retained in the forest and what is removed, thus preserving habitats, forest soil and forest microclimates. “

The Swedish forest vision on Close-to-nature forest management:

The EU’s forest strategy for 2030 clearly states that forest management systems like clear-cutting should only be used in duly justified cases since it affects above ground biodiversity, and causes the loss of carbon in the roots and part of the carbon in the soil.

The clear-cut and planting model, and the industrial tree stand forest landscape that is the result of this management, is according to the forest ecologist Timo Kuuluvainen¹: “in contradiction with the variable and complex characteristics of the disturbance-succession cycle observed in naturally dynamic forests with negligible human impact”.

Also, the forest ecologist stated that: “In particular, the generalization that the boreal forest is regulated by fierce stand-replacing disturbances, leading to the dominance of even-aged stand successions, has been disproved. However, this misconception has, until now, been repeated and used to legitimize the dominant practice of clear-cutting as a nature-based way to manage the forest.”

To tackle negative climate effects, biodiversity loss in forest landscapes, and increase resilience and resistance, there is an urgent need for a transition to a forest management model based on: “naturally emerging self-organized ecosystem dynamics that foster heterogeneity, biodiversity, resilience and adaptive capacity.”

Following the general principles for a Close-to-nature forest management, all forest management must meet following guidelines:

- Use unmanaged forests with a natural dynamic, shaped by natural processes and disturbance regimes, as reference areas. Management methods should be adapted to the natural forest dynamics so that, to the greatest extent possible, natural processes create a heterogeneous forest landscape. Reference areas can show if forestry is moving towards or away from an increased natural dynamic development in the managed forests. A Close-to-nature forest ma-

1. Kuuluvainen T. Forest management and biodiversity conservation based on natural ecosystem dynamics in northern Europe: the complexity challenge. *Ambio*. 2009 Sep;38(6):309-15. doi: 10.1579/08-a-490.1. PMID: 19860154. <https://pubmed.ncbi.nlm.nih.gov/19860154/>

nagement should be as close to the reference areas as possible, while extraction of valuable timber and other values from the forest is possible.

- Preserve and restore natural processes and functions of forest ecosystems. To ensure a resilient forest landscape, natural processes and functions of ecosystems must be preserved. These are, in many cases, regulating and supporting ecosystem services such as biogeochemical cycles as well as climate and water regulation.
- Preserve and restore structural complexity of forest ecosystems. Forestry practices must ensure sufficient nature consideration to preserve and restore structures, such as the amount and type of dead wood, old trees and wetlands.
- Preserve and restore natural tree species composition and diversity of forest ecosystems, both at a stand- and landscape scale. Trees form the basis of forest ecosystems by directly providing habitats and affecting biophysical conditions. Therefore, forestry should only use native tree species that, as far as possible, are naturally regenerated.
- Apply a landscape perspective. Planning should be done at a forest stand level as well as at a landscape level to ensure connectivity and to preserve and restore the natural variation in the forest landscape.
- Be based on best, and adapted to, new knowledge and experiences. Forestry should continuously be adapted to new research findings as well as practical experience.

2. The overall and general descriptions of the need for CNF and the state of the EU's forests are usually well-formulated and with solid sources.

3. There are wording problems and factual errors in some data, some background texts and in the boreal region guidelines, which make parts of the guidelines vague, open to wide interpretations, but also more difficult to use for practitioners. This applies specifically to the subchapter that we at Protect the Forest, Sweden, are most concerned about, namely the chapter on the boreal region. See specific views in comments on the text on the boreal region.

4. Although we wholeheartedly support this concept, there are practical challenges with the Integrated forest management concept. On the one hand, this concept favors biodiversity, resilience and adaptation. This applies when CNF is applied as a form of restoration and forest management in previously degenerated production stands and tree plantations. On the other hand, there are obvious risks in mixing nature conservation areas or protected forest areas, with CNF. This because commercial forestry in protected areas or nature conservation areas, with already existing nature values, or in unprotected near-natural or natural forests, has a high risk of leading to degeneration and negative impact on the amount of dead wood, old trees, carbon stocks, structural diversity, and a range of dynamic processes. That is, CNF applied in forests with high conservation values does not contribute to increased biological diversity and climate benefit, but instead the opposite. Although it is clearly stated in the guidelines for CNF² that forest management should not deplete, but rather promote biological diversity: "Closer-to-nature forest management serves as an accelerator for biodiversity restoration, biodiversity conservation and forest resilience...", and that therefore it should not be possible in practice to misuse CNF in such a way that practical management leads to depletion or negative impact on biodiversity of forest ecosystems, we see such risks.

The Swedish Forest Agency sees continuous cover forestry CCF and CNF as a complement to clear-cut forestry "...on a limited part of the forest land."

The forest industry has long claimed that forest management in the Nordic countries is already

2. European Commission, Directorate-General for Environment, Guidelines on closer-to-nature forest management, Publications Office of the European Union, 2023, <https://data.europa.eu/doi/10.2779/731018>

sustainable and mimics wild forest fires. But, this is far from a scientific truth. Productive forest land is land where it is potentially, from a production point of view, rational to conduct forestry and where the forest land can produce at least 1 m³ standing volume per hectare and year. In Sweden, there are approximately 23,000,000 hectares of productive forest land. The Swedish Forest Agency's latest estimate is that only 722,000 hectares in Sweden were managed with the Agency's broad definition of Continuous cover forestry in 2022³. This corresponds to only 3 percent of the productive forest area.

In Sweden, the Swedish Forest Agency and various forestry actors, as well as research projects, have almost exclusively treated continuous cover forestry (CCF) and CNF as something that should not be applied every where, rather only in forests with documented conservation values, social values, or multi-use values for reindeer husbandry etc. Often these values overlap. In practice, this means that CCF and CNF is a threat to biodiversity, rather than a gain for biodiversity. However, if the focus instead would be on firstly conserving and restoring near-natural and natural forests and then strictly protecting them, as well as applying CNF within the dominant part of the productive forest area consisting of even-aged stands created after clear-cutting, then CNF would be an asset and not a threat. Some argue that it is better to manage a forest with high conservation values with CNF instead of with the clear-cutting and planting model. But, this is a strange line of reasoning. Considering that over 90 % of the Swedish productive forest land is or has been affected by forestry in some way⁴, there is no room for CNF in the remaining high conservation value forests. It is important to create and maintain a safe haven for the biodiversity and all threatened and near-threatened forest-dwelling species where forestry is not allowed. So here is a better alternative, and that is to protect and safeguard all high conservation value forests from all forms of forestry!

”CNF should not become a Trojan horse to access timber and biomass in our remaining natural forests in the EU.”

CNF and eco-forestry should not become a Trojan horse to access timber and biomass in our remaining natural forests in the EU. We raise this issue in particular, as there are examples where forestry companies in Sweden have used modified forestry methods, such as so-called mosaic loggings, another word for clear-cutting with some conservation consideration “retention” measures, as an alibi to exploit high conservation value forests that in reality need protection.

Protection and restoration are needed, as well as new CNF models. A full scale transition today to CNF eco-forestry, will not, neither in the short nor medium term, mean a reduced need for protected forests.

There are two reasons:

First of all: There is too little area of natural and near-natural forest to reach the threshold levels for old natural forest at landscape level, in order to preserve living forests and the species

3. Swedish Forest Agency (2023-07-05). Åtgärder i skogsbruket; <https://www.skogsstyrelsen.se/statistik/statistik-efter-amne/atgarder-i-skogsbruket/>

4. Larsson, A., Bjelke, U., Dahlberg, A. & Sandström, J. (2011). Tillståndet i skogen. SLU Swedish Species Information Centre, Uppsala. SLU Artdatabanken rapporterar 9; <https://www.artdatabanken.se/publikationer/tillstandet-i-skogen/>

that are linked to primary and old-growth forests^{5,6,7}. There is no room for commercial extraction of biomass in today's remaining natural and near-natural forests in the Nordic countries. Modern forestry implies more forest roads and removal of wood, regardless of management model, which will further dilute habitats and valuable substrates, and contribute to further fragmentation, if used in natural and near-natural forests.

Second: The ecological delivery time for habitats for species associated with old-growth forest areas with high concentrations of dead wood and old trees, is very long, hundreds of years or more.

It will take a long time to recreate large amounts of dead wood, old conifer trees, older deciduous trees and other structures in the young and enormous production forests and plantation areas that dominate the landscapes of today⁸. Until the managed parts of the forest area has become more natural, this part will not be able to supply the habitats that more demanding species need, which is why the need for protection remains high.

One should therefore not allow and use CNF systems in protected areas nor in unprotected near-natural and natural forest.

5. The regional guidelines for CNF in the boreal region would probably be sharper and more useful if they were more in line with the general guidelines. The guidelines would have been more useful both in practical forest management and in terms of regional and national goals, and in terms of possible future legislation, if they did not contain inconsistent differences between the overall general guidelines and the regional ones. We fear that representatives with a great interest in the forest industry and with a conservative view of forest management partially have colored the content of the regional guidelines.

6. "Natural disturbance-based forest management" raised in relation to boreal CNF has a number of challenges and question marks. If one now assumes that the CNF in the boreal region will rest on this concept, then there are things to take into account and clarify, so that this do not lead to an overuse of clearcutting and BAU.

In the boreal guidelines, for example, it is not specified approximately what proportions there should be between different cutting methods. It is rather sweepingly formulated that certain areas can be used with CCF or uneven-aged management, others with clear-cutting or "retention" forestry. This opens the door for big parts of the areas under CNF to be managed with BAU-methods in the boreal region. If one listen to this lecture by Timo Kuuluvainen⁹, one of the researchers behind the concept of Natural disturbance-based forest management, or read the scientific articles that form the basis of Natural disturbance-based forest management¹⁰, then it is clear that the majority of the managed forest area in the Nordic, should be managed with various forms of CCF, while only perhaps a fifth can be managed with retention fellings that lead to more even-aged stands with a lot of retention, or consideration for nature. This would allow imitation of the more rare intense disturbances such as fire or storm cuts with high mortality on a stand level.

It is also emphasized that retention fellings should not be compared to today's clear-cuts in

5. Niklasson, M. & Nilsson, S. (2005), Skogsdynamik och arters bevarande. Studentlitteratur AB, Lund.

6. Mikusinski, G. , Orlikowska, E. H. , Bubnicki, J. W. , Jonsson, B. & Svensson, J. (2021). Strengthening the Network of High Conservation Value Forests in Boreal Landscapes. *Frontiers in Ecology and Evolution*, vol. 8; <https://www.frontiersin.org/articles/10.3389/fevo.2020.595730/full>

7. Angelstam, P., Manton, M., Green, M., Jonsson, B-G., Mikusińska, G., Svensson, J. & Sabatini, F. M. (2020). Sweden does not meet agreed national and international forest biodiversity targets: A call for adaptive landscape planning; <https://www.sciencedirect.com/science/article/pii/S0169204620303935>

8. Niklasson, M. & Nilsson, S. (2005), Skogsdynamik och arters bevarande. Studentlitteratur AB, Lund.

9. YouTube (2022). Timo Kuuluvainen: Natural disturbance-based forest management. YouTube; https://www.youtube.com/watch?v=rxw0cmMMw5Y&list=PLfwW3YIp2nidlnKMcL3X3rV_6VqWZW7yX&index=10

10. Kuuluvainen, T. (2009). Forest Management and Biodiversity Conservation Based on Natural Ecosystem Dynamics in Northern Europe: The Complexity Challenge. *AMBIO A Journal of the Human Environment* 38(6):309-15; <https://www.jstor.org/stable/40390241>

Finland and Sweden. Note that different forms of CCF already in themselves create conditions for mixed forests and for the regeneration of more classic pioneer tree species, because there is an opening for larger gaps etc within the CCF and CNF concepts. More on this topic read our comment under "GCNF page 10" below. Note that all forms of forest management must be preceded by a holistic GAP- analysis. In the EU, there is no shortage of even-aged spruce or pine stands. Nor is there a shortage of clear-cuts or young production stands established after clear-cutting. But, there is a lack of old-growth forest, dead wood, continuity forest and really old trees. Therefore, there is no need in a near future to imitate disturbances that create more young even-aged stands, and no room to transform even more forest areas to clear-cuts and even-aged forest management.

7. It is good that the guidelines are clear on that: "Primary and old-growth forests remaining in the EU should be strictly protected considering their high conservation value for both biodiversity and climate change mitigation". However, giving strict protection only to those forests that fall within the EU's definition of primary and old-growth forests is not enough to create functional green infrastructure and connectivity. In that case it will not be possible to create a large enough network of protected forests required to maintain viable populations of forest-dwelling species within their natural distribution areas, nor to live up to international environmental targets. We also need to provide strict protection of near-natural forests within the EU in order to achieve the environmental goals. In addition, there are question marks surrounding the very definitions of primary and old-growth forests. Question marks such as - that forests, which actually need strict formal protection, and which are unique forest habitats with a long ecological delivery time, such as continuity forests with conservation values in the Nordic countries - with a too strict interpretation of the concept of old-growth at the national level, could end up outside the definition. A near-natural continuity forest that is strictly protected will generally have, or with time gain a higher carbon stock, and higher levels of deadwood and old trees.

But if it is instead managed (with CNF), it would be fragmented by logging roads, while maintaining some conservation values, despite the extraction of wood, but not by far have the same structural diversity and amount of substrate as an unmanaged forest. Studies show that even the extensive selective harvesting of trees that took place long ago has a negative effect on the amount of coarse deadwood far into the future, especially in boreal forest ecosystems where it takes centuries to regenerate certain structures and elements. Read more about the need to protect and restore the forests of Sweden here: www.swedishforestvision.org



Is this the future of CNF management in continuity forest with high conservation values or in protected forest areas? Forest company SCA logged in this forest in 2023, a so called “customized logging” (aka CNF?) in a continuity forest with red listed species. Photo: Daniel Rutschman



Top pictures: There is a big difference between unmanaged forest and CNF/CCF-managed coniferous forest. Unmanaged primary- and old-growth forests holds a much larger structural diversity, amount of small niches, important ecological elements such as dead wood and old trees, as compared to CNF/CCF-managed forests. **Below pictures,** the same difference shown with a broad leaf forest stand unmanaged for a long time, and a broad leaf forest stand managed with CNF/CCF. Photo: Viktor Säfve and Sebastian Kirppu.

According to the EU Biodiversity Strategy, at least 30% of the land should be protected in the EU by 2030. Various nature conservation bodies, researchers and both the UN and the EU are also discussing targets of at least 30-50 percent protected land area^{1,2,3,4,5,6,7}. But 10 percent^{8,9} strictly protected productive forest area is not enough (one third of the 30 percent of EU's objectives for nature protection), if commercial forest management under the flag of CNF is allowed within the other 2 thirds of the protected areas!

A united European environmental movement, Sami organizations and many researchers support the demand to protect all forests with high conservation values in the mountain region and 30 percent of the productive forest area in Sweden: www.swedishforestvision.org

In Sweden, for example, it is difficult to monitor negative effects on valuable forest habitats that are managed with forestry without clear-cuts. This is because thinning and selective felling in most cases do not need to be notified to the Swedish Forest Agency. This means that in many cases it is possible to damage conservation values in forests without this being monitored or intercepted by the authorities.

A collective environmental movement, Sami organizations and many researchers therefore demand an implementation of an immediate logging moratorium in all forests with identified conservation values.

...and that:

- All forests with identified conservation values must be protected. The protection needs to be transparent, long-term, and based on the preservation of large, coherent forests of high quality. Protected areas should include all remaining primary and old-growth forests and all other forests with conservation values.

- Also, all forests mapped with remote sensing as potential continuity forest or forest with conservation values must be mapped in the field by SEPA. Where the field surveys confirm conservation or restoration values the area should be protected from logging.

1. <https://www.science.org/doi/10.1126/sciadv.aaw2869>

2. <https://www.cbd.int/gbf/targets/>

3. <https://www.campaignfornature.org/why-30-1>

4. <https://www.iucn.org/crossroads-blog/202108/we-need-protect-and-conserve-30-planet-it-has-be-right-30>

5. https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en

6. <https://www.half-earthproject.org/>

7. <https://www.cbd.int/doc/c/abb5/591f/2e46096d3f0330b08ce87a45/wg2020-03-03-en.pdf>

8. <https://academic.oup.com/bioscience/article/55/11/989/220923?login=false>

9. <https://www.swedishforestvision.org>

Comments about the document in chronological order

GCNF page 2: *“These guidelines have been prepared through active dialogue with Member State experts and key stakeholders, and they are based on a collaborative approach.”* and: *“The text might not necessarily reflect the views of all the listed individual authorities and organizations since it includes compromise drafting for areas on which views in the group significantly diverged.”*

Comment:

The parts of the CNF guidelines created in dialogue with various stakeholders such as industry and NGOs have created a document that is sometimes inconsistent. With hindsight - Perhaps it would have been better if the EU Commission only produced general guidelines for CNF that had consistent basic principles?

GCNF page 5: The EU Commission describes the aim of the guidelines as follows: *“The aim of these guidelines is therefore to promote biodiversity-friendly and adaptive forest management as part of a common framework for closer-to-nature forest management.”*

Comment: For the concept to promote biodiversity, it is fundamental that forestry is not applied in forests with conservation values. Extraction of timber and forestry infrastructure in the form of road networks in forests with conservation values reduces their conservation values and do not in any way increase them. In high risk countries such as Sweden, where right now tens of thousands of hectares of forest with high conservation values are notified for logging¹, and thousands of hectares of old forest and continuity forest are lost every year² the risk is high that CNF will be actively used to access timber in forests that should be given formal protection.

GCNF page 5: *“The guidelines will assist competent authorities and key stakeholders in developing and promoting biodiversity-friendly and adaptive practices in forest management across different scales, discussing challenges and opportunities.”*

Comment: If the guidelines are vague or the minimum levels for retention and nature consideration measures too low to meet nature conservation needs, then these will not assist, but rather open

the door for BAU. This is probably the risk with the guidelines that are specific to the boreal region.

In addition, it is important to point out that the guidelines for the boreal region specifically in some respects are so vaguely formulated and the minimum ambitions for nature consideration set so low that some stakeholders may interpret it as if Swedish forestry generally already practices CNF. That is to say, the guidelines risk leading to BAU in Sweden, and could be used as a Trojan horse to access timber in forests that must be protected.

One example is that loud representatives of the Swedish forest industry already claim that Swedish mainstream clear-cutting forestry in general already is the same as CNF. In a tweet in May 2023³, the lobbyist Peter Holmgren writes: “... we converted to close-to-nature forest management already 30 years ago.”

Swedish forest industry lobbyist:

“we converted to close-to-nature forest management already 30 years ago.”

1. <https://www.skogsmonitor.se/en>

2. Ahlström, A., Canadell, J. G., & Metcalfe, D. B. (2022). Widespread unquantified conversion of old boreal forests to plantations. *Earth's Future*, 10, e2022EF003221. <https://doi.org/10.1029/2022EF003221>

3. <https://twitter.com/pholmgren/status/1661777040800972800>



CNF forestry in Sweden already?

Photo: Jon Andersson and Viktor Säfve



The risk of an integrated approach being misused by forestry.

An integrated approach is highlighted in several places in the guidelines. That is to say, the goal of forestry does not divide the land between environmental protection areas and production areas, but integrate these together in the same place. This is desirable for the area being managed for wood production. According to a joint European environmental movement, Sami organizations and over 260 researchers¹, this should apply to the area that is outside of the Scandinavian Mountains Green Belt and the 30 percent of the Swedish productive forest land that needs protection. These stakeholders want to see strict protection of the entire internationally unique Scandinavian Mountains Green Belt.

It sounds good in theory with integrated land use, but there is a problem, and that is if, for example, when CNF is used within the areas that need to be formally protected. People have a strong tendency to prioritize economics over ecology when the choice is between these. This is reflected in this sentence in the guidelines for CNF which underlines the following: *“The main barrier that questionnaire respondents said was preventing them from using practices favoring biodiversity appeared to be economic.”*

In Sweden, there is an imminent risk that CNF is used as a Trojan horse in order to allow exploitation of everything from subalpine and alpine intact near-natural and natural forest (primary, old-growth forest and continuity forest) with CNF. And there is a risk that CNF is used as an alibi for exploitation of continuity forests with high conservation values that do not have strict protection. This would degenerate these forest habitats - not strengthen their biodiversity, as extensive recurrent loggings, creation of forestry road networks, adversely risks affecting processes such as self-thinning, levels of dead wood and adversely affecting the amount of old large trees etc. CNF shall not contribute to increased expansion of commercial forestry into forests that have not previously been managed by industrial forestry methods or forest machinery, and/or that have not been previously clear-cut.

Experiments with “alternative forestry models” have been used by, for example, the state owned forest company Sveaskog that used clear-cutting methods, when they felled a forest with high conservation values and saved a few more retention trees and tree groups than they usually do, and then called this a “mosaic logging”.

1. <https://www.swedishforestvision.org>

They meant that this was a form of nature-based forestry². (see 33.20 into this clip:)

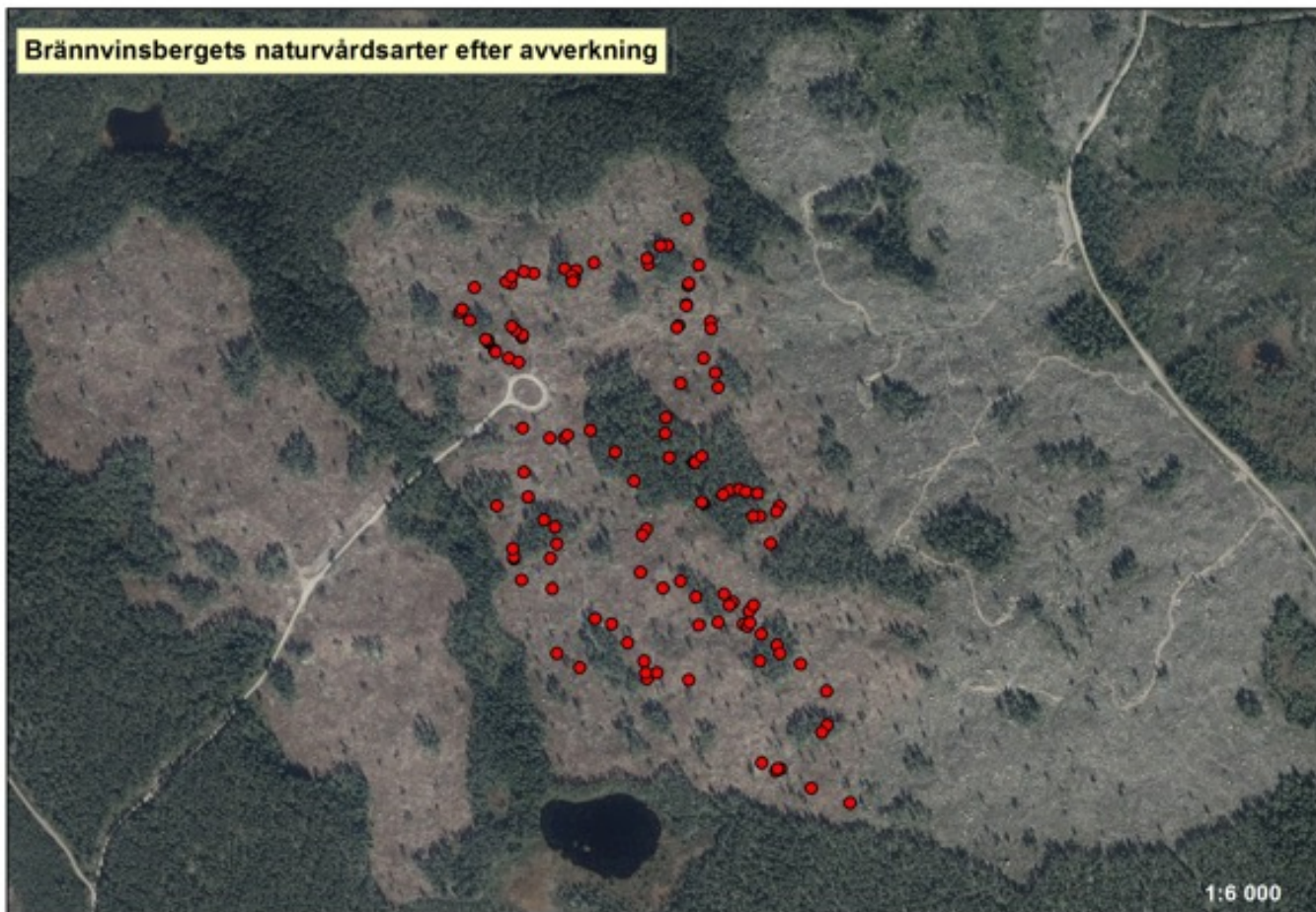
A study³ conducted by Protect the Forest in sub-alpine forests showed that historically extensive selectively logged forest had significantly less dead wood than the corresponding forest type that was not logged in the past.

Next page: A so-called “mosaic logging” (aka CNF?), carried out in forests with high conservation values by the state-owned FSC-certified forest company Sveaskog. The pictures show a satellite image after logging and before logging. The red dots show red-listed species and species that indicate high conservation values. Note how many of the habitat sites for the species that ended up right on the clear-cut.

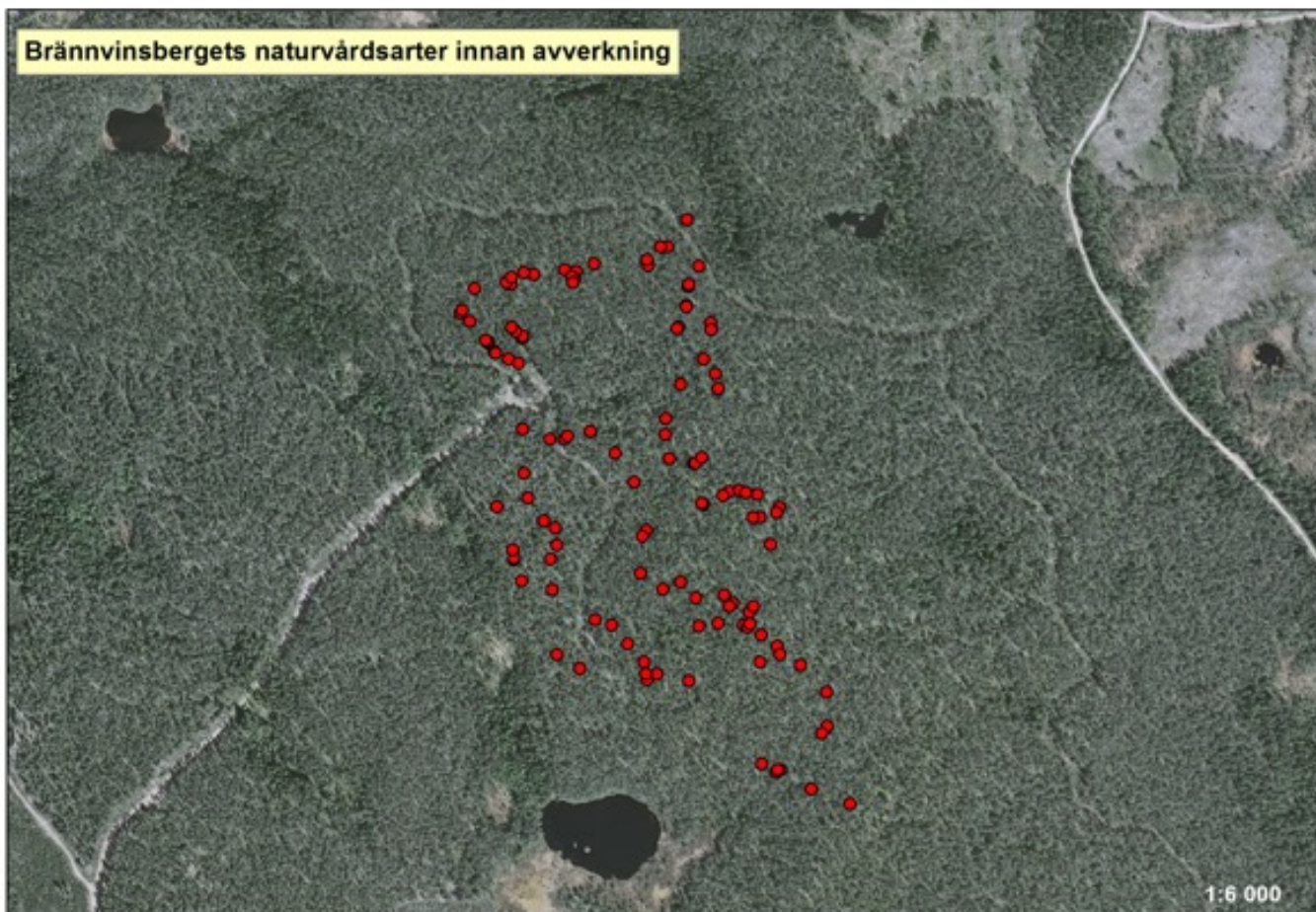
2. https://www.youtube.com/watch?v=q51FMbTOn_Q&t=1152s

3. https://skyddaskogen.se/wp-content/uploads/2021/06/skyddaskogen.se_forestry-at-the-edge-2020-final-lowres.pdf

Brännvinsbergets naturvårdsarter efter avverkning



Brännvinsbergets naturvårdsarter innan avverkning



GCNF page 10: *"Closer-to-nature management concepts differ by country and region. Overall, in north-east Europe, the concept of mimicking natural disturbances and maintaining natural structures (key habitats, deadwood, etc.) is prominent."*

Comment: There is no widespread use of CNF in north/north-east Europe. The practical examples that exist, such as Gothenburg's city forest management in Sweden, are based on dialogue with and exchange of knowledge with the forest management in the city of Lübeck. On the other hand, there are small experimental cuttings and theoretical models for "Natural disturbance-based forest management"¹, but they are at an experimental stage and today relatively theoretical models.

There are things to consider, and some question marks with the concept of "imitating" natural disturbances or "Natural disturbance-based forest management", as an CNF alternative instead of letting natural processes take their course, and minimizing management input:

- Natural disturbance-based forest management, if it is interpreted by foresters accustomed to standardized forestry lead to overly simplistic images of what forests are and should look like to be "natural". Forests are more complex and their structures cannot easily be imitated through various forms of logging.
- Builds on the idea that man must manage nature, and is therefore partly left in the agricultural philosophy, instead of relying on natural processes, and on the forest's adaptive and self-regulating abilities.
- Difficult to imitate disturbances such as fire, except, for example in terms of canopy tree cover. This is because wildfires have unique characteristics and create complex mosaics. They are also spontaneous and create a rich structural diversity and unique substrates (burnt wood, charred wood, burnt ground, lots of dead wood, fire-damaged trees, etc.). No other disturbance than forestry takes the wood out of the forest, which is why it is in some ways far-fetched to equate logging with non-anthropogenic disturbances.
- Can, if this is not managed very carefully lead to double stress and disturbance to the forest ecosystem, and negative effects on biodiversity and carbon stocks.
- Forest managers do not need to imitate ongoing disturbances such as storms, insect and fungal outbreaks, grazing ungulates, etc.
- It is important to do a GAP analysis in order to

firstly map what surpluses there are in the landscape (clear-cuts, even-aged production stands, etc.), secondly what deficits there are (continuity forest, old-growth forest, dead wood, really old trees), and thirdly which disturbance regimes are missing or are tightly controlled (fire, for example), also which disturbance regimes that may even have increased (or are at risk of increasing) due to climate change and mismanagement of the forest (drought damage, fungal and insect attacks, storm damage, etc.)

- Large logging levels on a given area can lead to a negative impact on internal dynamic processes such as self-thinning, etc.

GCNF Page 27: *"For central European forest types, establishing forest stands with deadwood amounts of more than 20 m3 ha in a network of forest landscapes rather than a lower mean in all stands has been recommended for biodiversity conservation."*

Comment: This does not only apply to central Europe. There are also similar recommendations for the Nordic region.

However, note that the level is far too low for some species, one of several reasons why there is a need for more protected forests and more set asides, where the amount of dead wood can be, or in the long run will be, much higher²³. A better approach than a static generalized minimum level of, with for example 20 m3 per hectare on average, would be to strive to be as close as possible to the natural forest levels, and set a percentage for this. Minimum levels, or lowest levels easily become maximum level, and norm, instead of the minimum level. If one puts the level closer to the natural levels, a maximization of the amount of dead wood would then be sought, rather than settling at the lowest level, which is often the result of policies with low minimum retention levels (like the FSC). This is our experience with, for example, the application of the certification standard for the FSC, as most forest companies try to fulfill only what is required, but not much more.

We can state that even FSC's low environmental requirements are not satisfactorily met in Sweden as certified companies continue to violate the regulations and cut down forests with high conservation values.

2. Ranius, T. & Fahrig, L. (2006). Targets for maintenance of dead wood for biodiversity conservation based on extinction thresholds. *Scandinavian Journal of Forest Research* 21 (3): 201 – 208; <https://www.tandfonline.com/doi/abs/10.1080/02827580600688269?journalCode=sfor20>

3. Jonsson, B.G. et al. (2016). Dead wood availability in managed Swedish forests – Policy outcomes and implications for biodiversity. *Forest Ecology and Management* 376 (2016) 174–182.

1. <https://www.frontiersin.org/articles/10.3389/ffgc.2021.629020/full>

The Alpine region chapter in the guidelines.

Land-use history and forestry techniques differ significantly between the more pristine subalpine and alpine forests of the Scandes, and the alpine forests of the Alps.

In the Scandinavian mountains and near them, there are today several hundred thousand hectares of internationally valuable forests with very high conservation values that lack formal protection. Large clear-cuts are used as a felling method and thousands of hectares of forest with very high conservation values are notified for final felling in the region. CNF is not at all suitable in these sub-alpine or alpine natural forests, which often are "primary and old-growth forests".

A collective environmental movement, Sami organizations and over 260 researchers demand total protection against all forms of commercial forestry, including CNF in near-natural and natural subalpine and alpine forests in Sweden. Our joint demand is: "Protect the Scandinavian Mountains Green Belt". The belt of subalpine and montane forest with conservation values along the Swedish mountains must be preserved in its entirety. This is one of the few remaining large intact forest landscapes in Europe and a unique opportunity to protect entire resilient ecosystems at landscape level. It is a key tool for retaining boreal biodiversity, ecological legacies, ecosystem services, adaptive capacity and resilience, which need to be safeguarded for the future.

Available to read here: www.swedishforestvision.org

The Scandinavian Mountains Green Belt

Near the Scandes, the mountain range running from north to south in Scandinavia, there is more than a 800 km long belt of montane (or subalpine) forest, relatively untouched by forestry⁴. It is an area with concentrations of primary and old-growth forests. This landscape is a very valuable natural heritage on a European level, and could be seen as the Amazon of Scandinavia. Scientists delineated the Scandinavian Mountains Green Belt as the largest intact forest landscape within the European Union⁵.

4. Svensson, J., Mikusinski, G., Jonsson, B. G., Andersson, J. and Bubnicki, J. (2018). The remnant natural boreal forest green belt of the Scandinavian mountain range. 5th European Congress of Conservation Biology. doi: 10.17011/conference/eccb2018/107733

5. SLU Swedish University of Agricultural Sciences (29-09-2020). Great conservation value of the Scandinavian Mountains Green Belt; <https://www.slu.se/en/ew-news/2020/9/great-conservation-value-of-the-scandinavian-mountains-green-belt/>

In the 19th and early 20th centuries, timber was floated down the rivers to Sweden's east coast, and the western mountainous areas were difficult to log and extract timber from. Even today, they are less accessible, which is why this forest belt remain. 56 % of the montane forest (both productive and low-productive) is formally protected today. According to the Forestry Act, logging of high conservation value montane forests is not permitted. Despite this, in 2021, approximately 30 per cent of the applications for logging in this area were permitted⁶. In order to protect biodiversity and maintain ecological processes, this north-south corridor, where species are able to migrate to escape a warmer climate, must be preserved. Scientists state that: "the Scandinavian Mountains Green Belt is a key entity supporting ecological legacies, boreal biodiversity and ecosystem services, resilience and adaptive capacity, which needs to be safeguarded for the future."⁷.

The Swedish EPA has mapped over 500,000 hectares of productive forest land with very high conservation values within or in close proximity to the border of subalpine forest. A government investigation (SOU 2020:73)⁸ suggests that: "...approximately 500,000-525,000 hectares of productive forest land, in the large contiguous natural forests within and in close proximity to the border of subalpine forest, ..., long-term preservation must be ensured".

This is motivated by, among other things the need: "...to preserve biological diversity at the highest level, ecosystem diversity". Today, however, there are no government decisions for the protection of all this internationally valuable forest, nor sufficient funds.

In reports^{9,10}, Protect the Forest has described the threat to valuable forests and the effects of CNF/ selective logging.

6. Skogsstyrelsen (2022-01-31). 300 miljoner kronor i ersättning 2021 efter nekade avverkningar i fjällnära skog; <https://via.tt.se/pressmeddelande/3315251/300-miljoner-kronor-i-ersattning-2021-efter-nekade-avverkningar-i-fjallnara-skog?publisherId=415163>

7. Svensson, J., Bubnicki, J. W., Jonsson, B. G., Andersson, J. & Mikusinski, G (2020). Conservation significance of intact forest landscapes in the Scandinavian Mountains Green Belt. *Landscape Ecology* 35: 2113-2131; <https://link.springer.com/article/10.1007/s10980-020-01088-4>

8. <https://www.regeringen.se/contentassets/8010961a5b09433aa-7de76d68d4ef8b8/starkt-aganderatt-flexibla-skyddsformer-och-naturvard-i-skogen-del-1-sou-202073/>

9. https://skyddaskogen.se/wp-content/uploads/2021/06/skyddaskogen.se_forestry-at-the-edge-2020-final-lowres.pdf

10. <https://skyddaskogen.se/wp-content/uploads/2022/08/forestry-at-the-edge-2017.pdf>





Photo: Jon Andersson

The boreal region

Note that the forestry industry in Sweden's analogy between clearcutting-based/retention forestry and wild fire has been disproved! The forest ecologist Timo Kuuluvainen have stated that: "In particular, the generalization that the boreal forest is regulated by fierce stand-replacing disturbances, leading to the dominance of even-aged stand successions, has been disproved. However, this misconception has, until now, been repeated and used to legitimize the dominant practice of clear-cutting as a nature-based way to manage the forest. The practical conclusion of this review paper is that the dominating forest management model in North European boreal forests, which is based on the clear-cut harvesting of timber and growing of even-aged stands, is in contradiction with the variable and complex characteristics of the disturbance-succession cycle observed in naturally dynamic forests with negligible human impact."¹.

GCNF: *"Much of the forest in this area (boreal) has been shaped by human intervention for hundreds of years. Before the era of even-aged RFM, which began in the mid-1900s, slash and burn agriculture impacted the forests for 2,000-3,000 years."*

Comment: This is not true for Sweden. We have had a researcher in forest history, professor Lars Östlund, comment on this. He states that it is not true at all that slash and burn agriculture generally affected the forests in northwestern Sweden for the past 2000-3000 years. This is a regional phenomenon, not something that generally applies throughout the boreal region.

The purpose of the text seems to be to say that there is no naturally dynamic forest in the boreal region, that it has been affected since millennia by human impact (and therefore withstands further impact?). But this is both generalizing and flat out wrong.

After dialogue with the forest historian professor Lars Östlund, we proposed a nuance to the section on forest history that relates to Sweden that we sent to the EU Commission. It read:

"...There are however typical gradients, where the southern forest (has) been used and transformed for agricultural purposes, including slash-and-burn cultivation (that) impacted the forests for centuries or even millennia. Also charcoal production was regionally important until the 1800s and fuel wood has been used extensively. In the northern boreal forests the impact was much more slight until the 1850s, when the region was subjected to a timber-frontier and commercial logging began. In the early 20th century, the era of intensive forestry began in the boreal region and commercial use of timber and pulp has since then led to a pervasive change of the forest landscape with severe loss and fragmentation of forests of high conservation value. An increasingly large part of ecological features important for biodiversity have been degraded in managed forests."

Yes, it is true that humans have affected boreal forests for a long time. But, there is a huge difference between the historical impact and the impact during the modern era of industrial forestry.

GCNF: *"Nowadays, Boreal forests mainly consist of semi-natural, even-aged forests, in which it is important to improve structures to increase biodiversity."*

Comment: The managed forests that emerged after clear-cutting, pre-commercial thinning and thinning are not "semi-natural forests", they are production stands and "semi-plantations" and plantations.

1. Kuuluvainen T. (2009). Forest management and biodiversity conservation based on natural ecosystem dynamics in northern Europe: the complexity challenge. *Ambio*. 2009 Sep;38(6):309-15. doi: 10.1579/08-a-490.1. PMID: 19860154; <https://pubmed.ncbi.nlm.nih.gov/19860154/>

Humans and the forest in the north boreal region of Sweden before the 19th century:

- Few people per square kilometer - large roadless forests.
- Low-intensity and extensive forest use; firewood, grazing (burning), wood tar, pot ash, fences and charcoal in limited areas.
- Simple technique - fire and axe.

Humans and the forest in the north boreal region of Sweden after the 1950s:

- More people per square kilometer who also consume much more per person.
- an increasingly expanded network of forest roads.
- Large-scale Industrial use and large-scale export.
- Highly intensive and mechanized industrial forest exploitation; pulp wood, timber and energy.
- Mechanization – intensive methods have been used during this period such as manipulation of waterways, use of pesticides, large-scale clear-cutting, establishment of tree plantations, soil scarification, ditching etc.

Note: Please watch this lecture by Professor Lars Östlund, leading forest historian, where he talks about this very issue: <https://www.youtube.com/watch?app=desktop&v=NZaodSF5q4c>

Are these pine and spruce plantations in Sweden semi-natural forests?

Photo: Viktor Säfve



GCNF: *"This has resulted in positive trends in the amounts of deadwood, and the numbers of large deciduous trees and old trees, for example."*

Comment: This is taken out of context! During the last 30 years since the 1990s, the area of naturally regenerated forest that has not previously been clear-cut, so-called continuity forest, has decreased dramatically. Approximately 200,000 hectares of forest land have been clear-cut annually in Sweden, which means that literally millions of hectares of forest land have been logged since the 1990s. Within this logged area there are large forest areas with high conservation values that have been lost, including continuity forests.

Also note that the levels of dead wood today are much lower than the thresholds for dead wood, and they are much, much lower than the natural levels of dead wood in the boreal region¹. As for the "positive trend" for amounts of dead wood, which in the guidelines is attributed to the fact that the law (on paper, but not in reality) equates environmental objectives and forest production, research has concluded that the increase is modest, not true for all of Sweden, and mostly due to storms in southern Sweden, not primarily an effect of increased environment ambitions².

The increase in deciduous trees is from a very low historical level caused by the forestry. Sweden neither reach international nor national environmental targets (note that international ambitions are even higher today than when the article was written!)³.

GCNF: *"From a landscape perspective, the forest land in the Boreal region is a mosaic of: (i) managed forests, including retention; (ii) unmanaged low-productivity forests; (iii) protected forests; and (iv) voluntary set-asides, including for biodiversity and forest conservation (26% in Sweden)"*

Comment: Is it unclear what is included in these percentages.

Forest land set aside in total for nature conservation, or what? Of the productive forest land area in Sweden, only about 6 percent⁴ has a transparent, long-term formal protection, of which about half is in the mountain region. Quantitative numbers do not save forest biodiversity.

See what Professor Per Angelstam says about this here: https://www.youtube.com/watch?v=q51FMbTOn_Q.

GCNF: *"Scarcity of fire (or other large-scale disturbances such as extensive windthrows) may change the natural composition of tree species, and the landscape may eventually become dominated by dense, spruce-rich forests that cannot host species adapted to open pine-dominated forests with the fire-created structures."*

Comment: Even if this was true, big clear-cuts and clearcutting is not the solution. In Sweden, millions of spruce seedlings are planted every year on clear-cuts⁵.

Are we really worried that light-demanding species may eventually become outcompeted due to CNF and the lack of fire? Instead, we should:

1. Not plant monocultures of spruce, not plant millions of spruce seedlings.
2. Not cut/thin away a lots of deciduous tree during pre-commercial thinning and thinning.
3. Not create dense single-layered even-aged production stands with conifers.

1. Linder, P. & L. Östlund (1992). Förändringar i norra Sveriges skogar 1870-1991. Svensk botanisk tidskrift 86(3): 199-215.

2. Jonsson, B.G. et al. (2016). Dead wood availability in managed Swedish forests – Policy outcomes and implications for biodiversity. Forest Ecology and Management 376 (2016) 174–182; <https://www.sciencedirect.com/science/article/pii/S0378112716303140>

3. Angelstam, P, Manton, M, Green, M, Jonsson, B.-G., Mikusiński, G., Svensson, J., Sabatini, F. M. (2020). Sweden does not meet agreed national and international forest biodiversity targets: A call for adaptive landscape planning. Landscape and Urban Planning 202, 2020, 103838, ISSN 0169-2046, <https://doi.org/10.1016/j.landurbplan.2020.103838>

4. Naturvårdsverket: <https://www.naturvardsverket.se/data-och-statistik/skog/skog-formellt-skyddad/>

5. Swedish Forest Agency, (visited 08-11-2023). Levererade skogsplantor; <https://www.skogsstyrelsen.se/statistik/statistik-efter-amine/levererade-skogsplantor/>

Also note that the spruce does not automatically, over time, take over all forest and soil types in the boreal region.

Further more: it is important to also include developments with spruce bark beetles infestations in central Europe and southern Scandinavia, in the analysis. In addition, there is no shortage in the Nordic forest landscape when it comes to clear-cuts, or when it comes to young managed even-aged pine tree stands after clear-cutting. Rather, it is continuity forest, dead wood, old trees, big trees and old-growth forest that are scarce biotopes.

GCNF: "Today, RFM is the prevailing management method in the Nordic and Baltic countries. Currently, around 55-60% of the forests in Finland and Sweden consist of tree stands younger than 60 years, representing an age-class distribution formed as a result of the historical use of forests."

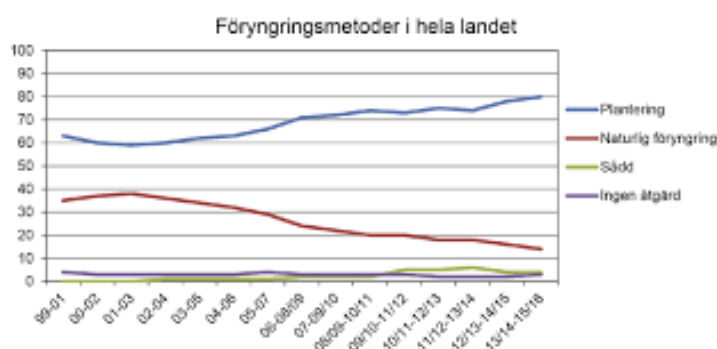
Comment: This is true. But, it may be useful in this context to describe this as an "inverted landscape", since the forest landscape in the boreal region, before the even-aged, clear-cut plantation forestry, was dominated by old-growth forests and continuity forests, while areas with disturbance regimes that were so intense that they led to the majority of all trees dying, were more unusual. Today, the forest area is dominated by even-aged managed stands created after clear-cutting. There is thus no shortage now, or in the coming decades, of such stands⁶.

GCNF: "Forests in the Boreal region are regenerated in several ways: (i) naturally; (ii) with planting and sowing/artificial regeneration; or often (iii) by a combination of both. However, in recent decades, the use of planting has considerably increased and natural regeneration has declined. More than half of the naturally regenerated area and most of the planted area in Boreal region forests are prepared with soil scarification"

Comment: Why is natural regeneration mentioned first, when it is planting that is most common in for example Sweden?

Here one should be more specific. In Sweden, for example, the planting of seedlings from nurseries dominates as regeneration method.

This graph from the Swedish Forest Agency clearly shows the development (1999-2016). The blue line shows how many percent of the logged area that is planted. The red line shows the development in terms of the use of natural regeneration. It has decreased and today, only about 8 % is naturally regenerated⁷.



6. Kuuluvainen T., Aakala T. (2011). Natural forest dynamics in boreal Fennoscandia: a review and classification. *Silva Fennica* vol. 45 no. 5 article id 73. <https://doi.org/10.14214/sf.73>

7. Swedish Forest Agency (visited 08-11-2023). Återväxternas kvalitet (resultat 2019/20-2021/22); <https://www.skogsstyrelsen.se/statistik/statistik-efter-amne/atervaxternas-kvalitet/>

GCNF: *"More than half of the naturally regenerated area and most of the planted area in Boreal region forests are prepared with soil scarification. This has positive effects for forest growth, ... resilience and natural regeneration..."*

Comment: Why would clear-cutting, soil scarification and planting have a "positive effect on forest resilience"? Survival for seedlings? Also, a lot of the natural regeneration is cleared away in thinning operations.

GCNF: *"...have benefited certain species, such as bilberry which is now abundant in Boreal forests."*

Comment: It might be appropriate to mention that bilberries are decreasing in southern Sweden due to forest management (dense production stands). The abundance of blueberries (biomass) may decrease by up to 70 % after clear-cutting and soil scarification. It then might take about 50 years for the blueberry to reach a state of equilibrium¹. Also, were bilberries more uncommon in the past?

GCNF: *"However, the amount of retention trees has been constantly growing since the 1990s."*

Comment: The Swedish Forest Agency has previously presented a large increase from the 1990s in the number of retention trees left on clear-cuts. But, they then issued a correction when it turned out that this data was incorrect: "- We have previously presented a large increase in the number of retention trees and tree parts during regeneration felling starting in 1998. The corrected statistics instead show a small increase or no change at all," said Svante Claesson, head of the unit for statistics and data collection at the Swedish Forest Agency."².

GCNF: *"The average area of individual clear-cuts in Boreal region forests is approximately 1.5 ha to 3 ha"*

Comment: This does not apply to northern Sweden's boreal region, or to big forest owners and companies. Also, average size is not the same as the size of all clear-cut patches. There is everything from less than one hectare clear-cuts to, tens or sometimes more than hundred hectare (or more) big clear-cuts.

GCNF: *"Sweden voluntarily set aside about 5% of their land and take the environment into greater consideration than the law requires during harvest. This includes protecting waterways and other valuable forest areas."*

Comment: For many years, the Swedish Forest Agency carried out inventories to evaluate how well forestry complies with the legal requirements. This inventory was then discontinued following pressure from the forest industry and remade³. The latest inventory results (2019) showed that 39% of all logging had a negative impact on biotopes that require consideration and thus do not meet the requirements of the law⁴.

There are no comprehensive maps, or metadata showing where these 5 percent set aside forest areas are located, or if they really exists. The statistics is based on a combination of geodata from companies and landowners, and estimates based on surveys of a group of private landowners. It should also be made clear that these areas lack formal protection and that they are not considered to be safeguarded in the long-term by the authorities in Sweden, but rather as "a nature

1. Kardell, L. & Eriksson, L. (2011). Blåbärs- och lingonrisets återhämtning 30 år efter kalavverkning och markberedning 1977-2010. SLU Rapport 112, 2011; https://pub.epsilon.slu.se/9196/7/kardell_l_rapport_112_121112.pdf

2. Skogsstyrelsen (29-10-2020). Skogsstyrelsen korrigerar statistik om träd och träddeklar som lämnats vid avverkning; <https://via.tt.se/pressmeddelande/3285850/skogsstyrelsen-korrigerar-statistik-om-trad-och-traddelar-som-lamnats-vid-avverkning?publisherId=415163>

3. Swedish Forest Agency (2013). Hänsynsuppföljning - Underlag inför detaljerad kravspecifikation (En delleverans från Dialog om miljöhänsyn); <http://shop.skogsstyrelsen.se/shop/9098/art12/20103912-89d2e5-1855.pdf>

4. Swedish Forest Agency (2019). Statistical database: Miljöhänsyn 2014/15-2016/17.

conservation measure of limited duration". The set aside areas are often small and suffer from negative edge effects⁵.

That the forestry would take full consideration to waterways is far from true. The consideration for water in Sweden and Finland is very deficient or non-existent and the levels are not science-based. In total, 31 % of all final fellings (logging) lacked a forest edge zone to the water in 2016-2019 in Sweden⁶.

GCNF: *"...Where it is assessed as leading to better forest growth...natural regeneration could be combined with assisted planting or seedings of adapted native tree species..."*

Comment: The forestry industry generally considers that planting benefits forest growth, does this mean that this becomes CNF and then is justified?!

GCNF: *"Especially on drier and less fertile soils, retention forestry combined with prescribed burning can be an alternative starting point for increasing structural complexity and tree species diversity. "*

Prescribed burning is likely an important component to consider within parts of the CNF-managed forest area. But it is a little generalizing that clear-cutting/retention forestry can be used on dry and less productive forest types. Again. Clearcutting does not resemble natural forest dynamics and only a part of the forests in the Nordics, were shaped by forest dynamics with intense disturbances such as severe fire and storm falls, which resulted in high mortality and in even-aged stands. Even on drier and low-productive lands, you can use different forms of CCF timber harvesting, also combined with prescribed burning.

GCNF: *"5-10% should be the strict minimum percentage of forest dedicated to retention patches"*

Comment: We consider this minimum level to be too low to cover buffer zones against water, protection of biodiversity and species dependent on retention. Also, percentage of what? Percentage of standing volume in the forest that is felled, or percentage of the area? It is probably relatively common for forest companies and forest owners to leave retention that is not representative, in terms of standing volume and land productivity. This, in order to create a quantitative retention surfaces that statistically appears to be X percent of the logged area, but in practice do not constitute the same amount of the standing biomass. Our experience from field studies is that it is not entirely unusual that the forestry select retention patches that consist of more low-productive wet soil types or rocky outcrops, with low timber values and a lower standing volume, than the average in the logged area.

No modern study states that it is enough to leave 5 percent as nature consideration, to create functional buffer zones against water and sensitive biotopes, and at the same time preserve habitats in the logged areas for species that require retention patches and trees^{7,8}. In addition, 5-10 percent would not take forestry in Sweden "closer to nature". Should BAU prevail in Nordic forestry under the cover of CNF?

There are lots of lakes, rivers, small streams, etc. in Sweden and Finland. 5 - 10 percent retention would not come close to being able to contribute to functional evidence-based buffer zones

5. Aune, K., Jonsson, B.G. & Moen, J. (2005). Isolation and edge effects among woodland key habitats in Sweden: Is forest policy promoting fragmentation?. *Biological Conservation* 124 (1): 89-95; <https://doi.org/10.1016/j.biocon.2005.01.015>.

6. Swedish Forest Agency (2022). Miljöhänsyn vid förnygringsavverkning; https://www.skogsstyrelsen.se/globalassets/statistik/statistikfaktablad/fo1403-statistikfaktablad-miljohansyn-vid-fornygringsavverkning_2022.pdf

7. Vanha-Majamaa, I. & Jalonen, J. (2001), Green tree retention in Fennoscandian forestry. *Scandinavian Journal of Forest Research* 16: 79-90;

<http://www.tandfonline.com/doi/pdf/10.1080/028275801300004433?needAccess=true>

8. Fedrowitz, K. et al (2014). Can retention forestry help conserve biodiversity? A meta-analysis. *Journal of Applied Ecology* 51: 1669-1679; <http://onlinelibrary.wiley.com/doi/10.1111/1365-2664.12289/epdf>

against these watercourses⁹.

Approximately the same minimum-level that is recommended in the CNF guidelines is already left as retention patches in Sweden and this is not enough at all.

GCNF: *"As an example, ranges of 10-80 m³ of deadwood per hectare with a peak at 20-30 m³ per hectare..."*

Comment: What peak? 20-30 m³ per hectare in the managed part of the forest area is a minimum, not a peak.

9. Kuglerová, L., Jyväsjärvi, J., Ruffing, C., Muotka, T., Jonsson, A., Andersson, E., Richardson, J. S. (2020). Cutting edge: A comparison of contemporary practices of riparian buffer retention around small streams in Canada, Finland, and Sweden. *Water Resources Research*, 56, e2019WR026381. <https://doi.org/10.1029/2019WR026381>



www.skyddaskogen.se



info@skyddaskogen.se