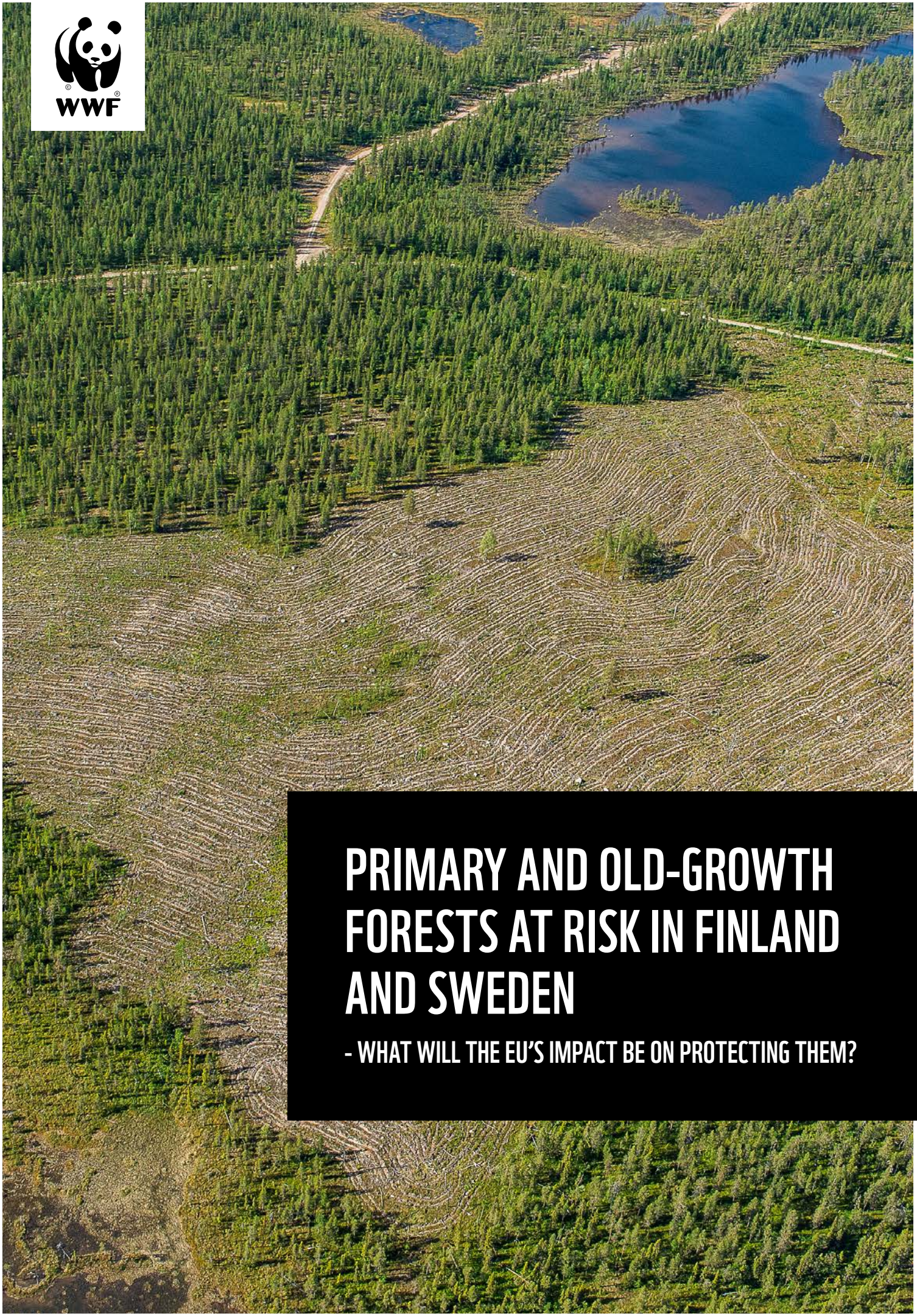

# PRIMARY AND OLD-GROWTH FORESTS AT RISK IN FINLAND AND SWEDEN

## - WHAT WILL THE EU'S IMPACT BE ON PROTECTING THEM?

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**About WWF**

WWF is an independent conservation organisation, with more than 38 million followers and a global network active through local leadership in over 100 countries. Our mission is to stop the degradation of the planet's natural environment and to build a future in which people live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

WWF Finland's and WWF Sweden's vision on forests is:

The network of protected forest areas is expanded significantly to be representative in terms of geographical region and forest habitat types, and to ensure that all remaining primary and old-growth forests are protected;

Degraded forest habitats are restored to meet the requirements stipulated by international agreements;

The habitat conditions for forest species are safeguarded within commercially managed forests, achieving clear-cut-free forestry regimes, improved retention of habitat trees and buffer zones.

The vision on forests is attempted to be achieved through influencing political and forest sector decision makers, engagement in FSC-certification, exploring new mechanisms and collaboration in projects.

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**Contributors:** Many colleagues from WWF offices across Europe have provided valuable contributions to planning this report. Thomas Chambers and Petri Keto-Tokoi gave insightful reflection to the work. The report has also included a review by a few primary and old-growth forest researchers.

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# SUMMARY


Europe has lost most of its primary and old-growth forests and most of the remaining area can be found in Finland, Sweden and central-eastern Europe[R1]. These forests host a high number of endangered species and act as important carbon storages and sinks. Old-growth forest-dwelling species are important also for wood production in terms of increasing resilience in managed forest areas surrounding old-growth forests.

As part of the EU's Green Deal, member states have engaged in protecting primary and old-growth forests. However, there are serious questions as to whether Finland and Sweden are proceeding towards the decisions needed to comply with the commitments they have made. Meanwhile, primary and old-growth forests are being logged in both countries.

In this report we describe the estimated status of primary and old-growth forests and the current ambitions of the governments of Finland and Sweden in complying with EU policies and regulations that address the protection of these forests. We present the wide array of information that has been accumulated in both countries. Based on this knowledge we give recommendations to make sufficient decisions on protecting the last primary forests and old-growth forests in these countries.

Two different categories of forests are dealt with in this report. Based on the EU's Biodiversity Strategy[R2], both primary forests and old-growth forests should be protected. Primary forests have barely any signs of human intervention, and old-growth forests have several characteristics that provide valuable habitats for forest-dwelling species due to low human intervention.

The current situation points towards the governments failing in protecting primary and old-growth forests. The current political priority is not to strengthen forest conservation, but to increase forest production and to secure biomass supply to the forest industry, increase focus on BECCS (Bio-Energy Carbon Capture and Storage) and, at least rhetorically, to secure land-owners' rights. This is notable in budget cuts in both Sweden and Finland with regards to protecting forests with high conservation value, and in clearly flawed processes which are failing to credibly implement agreements on forest related policies under the EU Green Deal, as described in this report.

Based on the information available, we formulate recommendations to the Governments of Finland and Sweden, to the European Commission, and to companies:


## Purpose of this report

The purpose of this report is to:

- Share information with national policymakers, companies and the European Commission as well as members of the European Parliament on the current national context and implementation status in Sweden and Finland regarding defining, mapping, monitoring and protecting primary and old-growth forests which relate to policies and legislation under EU's Green Deal.
- Highlight the need for national governments to implement, credibly and coherently the EU's policies that aim to map and protect primary and old-growth forests.
- Highlight the need for the European Commission to evaluate Finnish and Swedish processes in order to secure credible EU policy implementation regarding the protection of primary and old-growth forests under the EU's Green Deal.

## Clarifications

The EU guidelines on defining, mapping, monitoring and strictly protecting primary and old-growth forests expect member states to use their ownmethodology to conduct the identification of these forests. The methodologies should build on the list of indicators in the EU guidelines[R3], and be consistent with the common definitions. Member State methodologies should be: science-based; developed transparently and shared publicly; ensure cross-border harmonisation and consistency with the common definition; and make it possible to objectively verify fit and appropriate implementation by all relevant forest stakeholders[R3].

In this report, the term "criteria" is used as an inclusive term for indicators and associated thresholds in identifying primary and old-growth forests.

In this report, references are delineated from footnotes with a preceding R ([R1, R2,] etc), and listed in full in the final References section.



# RECOMMENDATIONS:

## 1. The national governments of Finland and Sweden should:

- Implement the EU guidelines on primary and old-growth forests in full[R3], and utilise sound science for defining the criteria for primary and old-growth forests.
- In Finland, protect the already known and mapped state-owned forests and map privately owned lands which has never been done in any systematic way.
- In Sweden, impose a logging moratorium of delineated primary and old-growth forests, and allocate resources to map and protect those which have not yet been verified and delineated, e.g. "continuity forests"[1].
- Allocate resources for mapping and protecting primary forests and old-growth forests on private lands.
- Respect the rights of the Sámi people.

## 2. The European Commission should:

- Develop and clearly communicate how the European Commission will monitor Finland and Sweden in mapping and protecting primary and old-growth forest according to expectations in EU policies including legal compliance to EU regulations.
- Explore different mechanisms to develop shared financing for mapping, monitoring and protecting primary and old-growth forests together with national governments, forest owners, companies and stakeholders.

## 3. Companies should:

- Push governments to credibly implement international agreements and the EU's policies and regulations in order to protect forests with high conservation value, including primary and old-growth forests.
- Engage in market-based systems, e.g. certification systems and payment for ecosystem services, so that they clearly contribute to the protection and restoration of high conservation value forests including primary and old-growth forests.
- Publicly commit to not sourcing from high conservation value forests including primary and old-growth forests in Europe and globally, and take additional measures to ensure that sourcing does not include biomass from these forests.
- Together with stakeholders, governments and the European Commission, explore the development of shared finance mechanisms to map and protect primary and old-growth forests.

[1] Continuity forests: Forest that contains species of conservation value, whose presence is explained by the fact that suitable forest environments and substrates have existed in this forest or its vicinity for a long time. (Definition from SFA report[R73])

# POLICY CONTEXT: EU'S GREEN DEAL AND FORESTS

Under the EU's Green Deal, a number of EU policies relate directly or indirectly to the importance of identifying and protecting the last remaining primary and old-growth forests. Some of these policies are legislative requirements (EUDR, REDiii, LULUCF and NRL)[2] and some are strategies committed to by member states through the Council of the European Union. Regarding the latter policy category, the most important is the EU's Biodiversity Strategy. This expects member states to strictly protect the remaining primary and old-growth forests, even beyond the 10 percent strict protection target. Also, the EU's Green Deal is instrumental in order for signatory parties to achieve agreed goals under both United Nations convention on biodiversity (CBD) and climate change (UNFCCC)[3].

To guide member states, the European Commission (EC) has developed, together with experts from EU member states, *Guidelines for Defining, Mapping, Monitoring and Strictly Protecting EU Primary and Old-Growth Forests*[R4] (referred to here on as "the EU guidelines"). However, in EU legislation there are some built-in anomalies which could function as loopholes. Nonetheless, the clear expectation is that member states should protect all remaining primary and old-growth forests. In the national implementation in Finland and Sweden, it is evident that governments are attempting to use these loopholes, which undermines the clear intentions of EU Green Deal policies and regulations. This report presents evidence of this.

The Nature Restoration Law (NRL) states that Annex 1 habitat types under the Habitat directive must be restored to favorable status. Primary and old-growth forests are important due to the relation to Annex 1 forest habitat types such as the Western Taiga and Fennoscandian herb-rich forests with Picea abies. For this goal, national favorable reference areas are to be defined. It is likely that the area to be restored will be relatively high for both Sweden and Finland - if using scientifically sound baselines for the historical distribution of forest habitats and for setting favorable reference levels for forest species. The EC has developed guidelines that member states are expected to follow[R5]. Hence, the implementation of the NRL - regarding both the achievement of restoration targets and non-detoriation - creates a need to develop different policy instruments as well as different ways for financing. Most of the forest habitats in Sweden and Finland have been seriously degraded and are in an unfavourable conservation status - implementing the NRL thus also requires guaranteeing the extent and quality of primary and old-growth forests[R6]. It is vital that member states implement the NRL in a scientifically credible manner which includes the preservation of the last remaining primary and old-growth forests.

The Renewable Energy Directive (REDiii) does not allow primary forest biomass from primary and old-growth forests to be used as a feedstock in the production of power, heat and biofuels (so called "bioenergy") in cases where the activity is financially subsidised by the government and/or if the energy is to be accounted towards the renewable energy targets of a member state. The EU Deforestation Regulation (EUDR) prohibits the conversion of all forests to agriculture, and the degradation of primary forests. The Land Use, Land-Use Change and Forestry Regulation (LULUCF) coordinates Member State action on land-based carbon sequestration - to which primary and old-growth forests are relevant[R7].

**Photo 1.** Old-growth forest that has been logged in Sweden. © Ola Jennersten

## Explanation of forest categorization: productive forests and low productive forests in Sweden and Finland

In this report, a distinction is made between "low productive forests" and "productive forests". This does not refer to whether forests are available for wood supply, or not, but it relates to forests having a relatively lower or higher annual growth rate, and how forest management is regulated accordingly. This also has implications on logging threats to different forest habitats, conservation values and representativeness.

In Sweden, productive forests are defined in the national forest law as "forest land that... can produce an average of at least one cubic meter of timber per hectare per year"[R8]. Forests that produce less than this are referred to as "forest impediments" in the forest legislation (but referred to as "low productive forest" in this report). According to the national forest law, "logging, forest management measures, and fertilization must not take place in low productive forests larger than 0.1 hectares. However, individual trees may be felled if it does not alter the character of the natural environment. Hence, forest management is generally not practiced in low productive forests, but still these forests do not have full strict legal protection.

In Finland, the national forest law does not distinguish productive and low productive forests in terms of logging rules. This means that forests in both categories can be clear-cut similarly, provided that tree regeneration is ensured. The only exception is for the ditched swamp forests that can only be logged if some biodiversity trees are left on the cut site or the site is restored after logging by closing ditches[R9].

Productive and low productive forests have different values for forest-dwelling species. Low productive forests produce less live and deadwood compared to productive forests and thus host less wood-dependent species. Furthermore, the species composition of low-productive and productive forests differ and are therefore not comparable[R10].

[2] EUDR - EU's Deforestation Regulation; REDiii - EU's Renewable Energy Directive; LULUCF - EU's Regulation on Land Use, Land-Use Change, and Forestry; NRL - EU's Nature Restoration Law

[3] UNFCBD - United Nations Framework on Convention on Biological Biodiversity, UNFCCC - United Nations Framework Convention on Climate Change

# CURRENT STATUS OF PROTECTION & LOGGING OF PRIMARY AND OLD-GROWTH FORESTS IN SWEDEN AND FINLAND

## Finland: The government is ignoring previously mapped primary and old-growth forests

About 85 percent of Finland's land area is classified as forests (26 million Ha). About 20 percent, 5,7 million Ha, are different low productivity forests (see fact box)[R11]. The total forest area that is strictly protected is 2,27 million Ha, which is equivalent to 10 percent of the total forest area. The total area of productive forests (see fact box) that is strictly protected is 1,23 million Ha, which is 6,1 percent of the area of productive forests (but in the southern part of the country (south of Lapland) the number is only 3 percent)[R11]. Approximately 75 percent of the total strictly protected area in Southern Finland has been managed in the past and is to some extent ecologically degraded[R12].

There is no data on the exact area of primary and old-growth forests in strictly protected areas in Finland. Here we introduce some of the analyses and data that have been produced in different processes and by different institutions. We then conclude that clear, transparent data is still missing. Most of the protected areas are located in the East and in the North of Finland leaving vast areas in the Southern part of the country with very little protected areas.

- During the 1990s Finland protected around 300 000 Ha of old-growth forests in a national old-growth forest conservation programme[R13].
- In addition, there are around 200 000 Ha of primary and old-growth forests in protected wilderness areas which are all located in northern Lapland. The area of primary and old-growth forests in other conservation areas, such as national parks, has not been determined although Parks and Wildlife Finland have made some analyses.
- The Finnish Environment Institute (SYKE) and the Natural Resource Institute (LUKE) estimate that there are in total 624 500 Ha of primary and old-growth forests of which 96 900 Ha are unprotected[4]. But here they utilize very tight thresholds for old-growth forests meaning that in practice the area for both protected and unprotected is clearly higher. Also, not all areas included in this analysis under the category "protected" are strictly protected. Part of the areas are put aside by Metsähallitus's own decision that can be invalidated.
- Finland has reported in 2019 to the EC 1 299 000 Ha of Western Taiga. Out of this area 928 600 - 962 800 Ha (71-76 %) is on Natura 2000 -areas leaving 336 200 - 370 400 Ha totally unprotected (24-29 %).
- Metsähallitus states that it has protected strictly or with their own decision 800 000 ha of natural forests and also states that mapping of Annex 1 habitat Western Taiga has not been done comprehensively because of the vast total area of forests (https://www.metsa.fi/vastuullinen-liiketoiminta/metsatalous/toiminnan-suunnittelu/lapin-luonnonmetsat/). The analysis of SYKE and LUKE does not identify the same number of Ha.

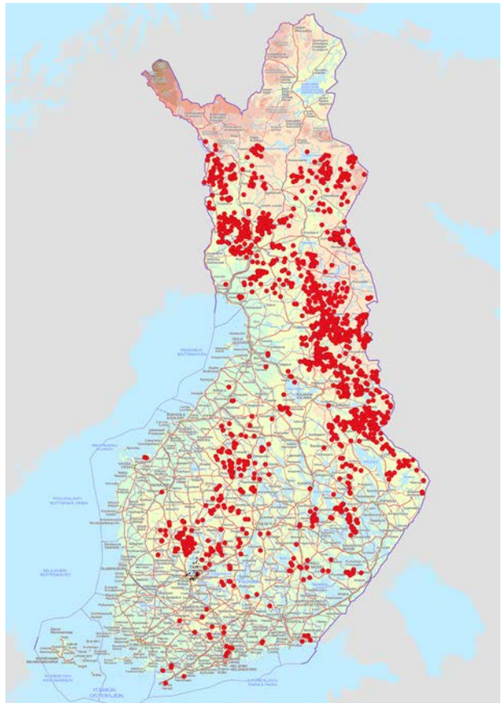

**Figure 1.** The map of unprotected primary and old-growth forest on state-owned land to the south of the Sámi homeland. © Natural Forest Working Group. See also more details on their mapping https://koneensaatio.fi/tarinat-ja-julkaisut/valtion-mailta-loytyi-runsaasti-suojelemattomia-vanhoja-metsia/

[4] The criteria that SYKE and LUKE utilize in their report is found in its Table L2.4b. Translation by WWF: Estimates for the area of old-growth forests (km²) based on the age of 120 years on southern and middle boreal zone, 140 years on North Boreal zone and 160 in Forest and Fell Lapland conifer dominated forests. In deciduous dominated forests the age is respectively 80/80/100 years. Criteria for deadwood "there is plenty of different aged deadwood in relation to the wood production capacity of the growing site" or "there is plenty of deadwood created at one time occasion or some different aged deadwood". A criterion was also included on natural disturbances.



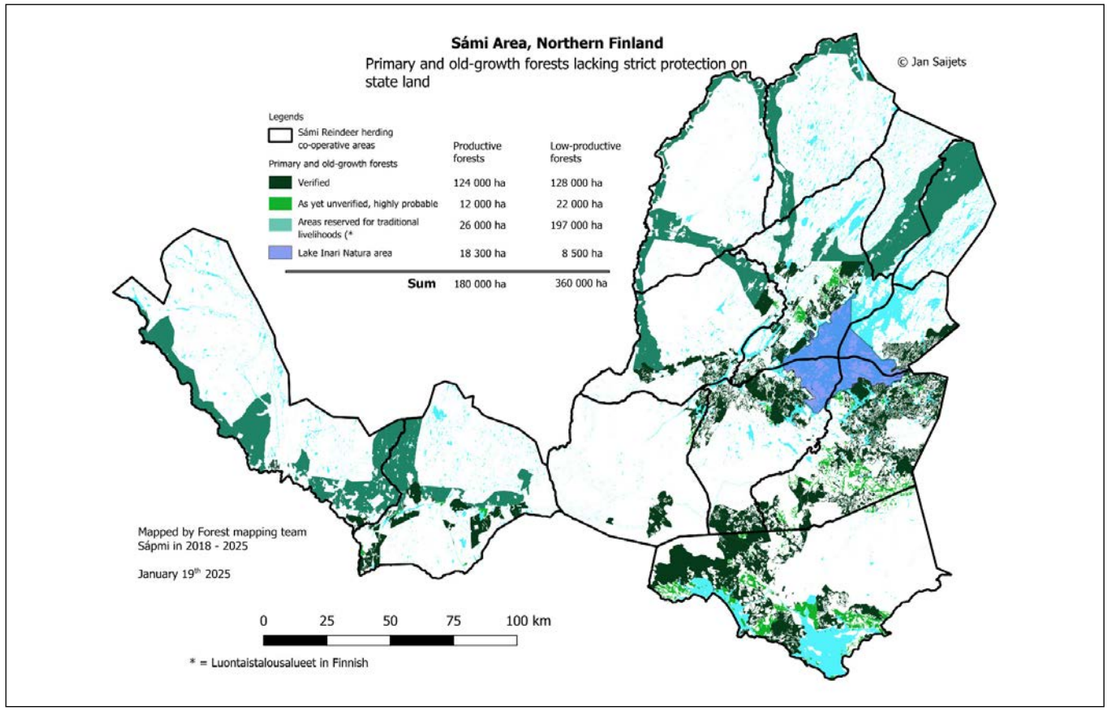


**Figure 2.** The map of unprotected primary and old-growth forests on state-owned land in Sámi homeland. This map and the area of mapped forests are updated on this website https://docs.google.com/presentation/d/16rJdU3EB-lp2QXZcrpyypXy313sG1GAM/edit#slide=id.p1 Here referred to this web site on the 20th January, 2025. © Jan Saijets

It is crucial that the government of Finland conducts new analyses on the area of primary and old-growth forests based on variables that are measured as part of the NFI: e.g. no management during 30 years or no management at all, naturally regenerated, and with younger age thresholds compared to the ones SYKE and LUKE utilized for their estimates. These kinds of analyses have previously been published by SYKE[R15] but have not been taken into consideration in the latest work by SYKE and LUKE[R14]. Their numbers of hectares are many times less than previously estimated by Metsähallitus and the Natural Forest Working Group as well as Forest Mapping Team Sápmi, which conducted mapping on state-owned forests using lower thresholds for deadwood and forest age. Metsähallitus has not published the data of the forests that they claim to be protected. Based on available public data, they have already mapped or taken into account within agreements with Sámi people 600 000 Ha of unprotected primary and old-growth forests in the whole of Finland (including the Sámi homeland)[5]. In addition to this area, forest specialists of the Natural Forest Working Group (financed by the Kone Foundation) have mapped an additional unprotected 100 000 Ha to the South of the Sámi homeland[6] (Fig 1. incl. link to more information). In the Sámi homeland, another independent expert group, the Forest Mapping Team Sápmi have mapped 540 000 unprotected Ha[R16] (Fig. 2 & 3) which partly overlaps with the mapping conducted by Metsähallitus. In the Sámi homeland there are still areas that have not been mapped because of a lack of resources for the Forest Mapping TeamSápmi and the lack of interest from the national government.

**To conclude, the government of Finland must produce new analyses on the area of protected and unprotected primary and old-growth forests as these numbers are not yet known. Another take-home message is that instead of focusing solely on new analyses a clear decision on protection could be made immediately: the total area of mapped unprotected primary and old-growth forests on state-owned lands is at least 700 000 Ha[5] (Fig 1). Some potential areas have not yet been verified in the field meaning that once these areas are mapped, more forests must be field-verified and protected.**

**Figure 3.** Animation of fellings in old-growth forest in the Muddusjärvi reindeer herders' community, 1940-2021. © Jan Saijets

[5] This 600 000 Ha covers all of Finland (incl. Sámi homeland) but there is no public information on exactly how much of it is on Sámi homeland because Metsähallitus does not provide the information, not even to the Ministry of the Environment. See https://koneensaatio.fi/tarinat-ja-julkaisut/valtion-mailta-loytyi-runsaasti-suojelemattomia-vanhoja-metsia/

[6] Sámi homeland is shown in Fig 2.

In Finland, old-growth forests have been logged throughout the 21st century[R17,18]. Currently, even though there is no national moratorium covering the areas of primary and old-growth forests, it seems that forest industry companies are waiting for the national criteria and meanwhile they are not willing to buy wood from potential primary and old-growth forests. Where primary and old-growth forests occur on FSC certified land, they meet the High Conservation Value criteria of FSC, which should prevent FSC-certified forest industry companies from buying wood from these sites. The reluctance of forest industry companies to buy wood from these forests is also a result of Greenpeace monitoring forest activities in mapped primary and old-growth forests. There are cases where forest companies have abstained from buying wood from these sites after Greenpeace has notified them on the issue. However, there are some unfortunate examples of energy power plants buying wood from primary and old-growth forests for combustion and energy recovery. This shows that the sustainability criteria in the previous Renewable Energy Directive (REDii) were not sufficient and REDiii safeguards have not yet been properly implemented in national legislation.

It seems that the Finnish government is not willing to set science-based criteria that would cover all primary and old-growth forests as required by the EU's Biodiversity Strategy[7]. Consequently, the government might end up with a situation where private companies have to be able to identify primary and old-growth forests themselves when planning to buy wood from forests that are likely to meet the criteria. For the time being, the customers and financiers of the forest industry cannot be certain that the products from Finland are not made from primary and old-growth forests. FSC-certification covers only about 10 % of the forest area in Finland. Part of the preserved areas under FSC are strictly protected but part of them are not. If these areas are hit with disturbances the wood has to be logged according to the law. PEFC-certification that covers 90 percent of managed forests in Finland does in practice not prohibit and hinder the logging of primary and old-growth forest loggings at all. Thus, the only way to ensure protection of primary and old-growth forests in Finland is with strict protection according to the Nature Conservation Law.

## Sweden: Thousands of hectares of primary and old-growth forests are logged annually

About 68 percent of Sweden's land area is classified as forests: 27,9 million Ha. About 16 percent, 4,4 million Ha, are different low productivity forests (also referred to as forest impediments, see fact box), e.g. alpine birch forest or forests on mires, which are generally not managed according to legislation (see Photos 2 & 3). Of the total forest area, 8,9 percent has strict protection (ca. 2,5 million ha) and the strictly protected share of the productive forest area amounts to 6,1 percent (ca. 1,4 million ha). In the subalpine region about 57 percent of the forests have strict protection, but only 3,9 percent in the rest of the country[R19]. The last remaining larger intact forest landscapes remain in the subalpine region which in itself is an argument for protection[R20]. Consequently, strict protection is skewed towards the northwest and a substantial amount is on low productive forests. This raises questions about representative protection of forest habitats. For instance, species preferences and biodiversity differ between more productive versus low productive forest types[R21].

Sweden likely has the largest area of primary and old-growth forests in the EU[R22]. However, as mentioned, the distribution is geographically skewed towards the north-west of Sweden. This can be explained by the progressive spread of industrial clear-cutting from south to north and from east to west, but also by reduced economic viability due to lower standing volume per hectare and higher transport costs.

**Photo 2.** Low-productive non-managed primary/old-growth alpine birch forest.
© Wild Wonders of Europe / Peter Cairns / WWF

**Photo 3.** Low-productive non-managed primary/old-growth mire forest. © Ola Jennersten / WWF

[7] On the Finnish government's position on the national criteria stated by the member of the Finnish Parliament representing the Prime Minister party in a panel discussion (https://www.youtube.com/watch?v=Eythb7qPwVI), as well as by the Finnish Ministry of the Environment in stakeholder meetings and in the media on the 15th October, 2024 (https://www.iltalehti.fi/politiikka/a/4edb2e4b-d1d4-4f7d-be91-9756b9f75061).



Applying the EU primary and old-growth forest guidelines, the Swedish Forest Agency (SFA) and the Environmental Protection Agency (SEPA) have presented geographically delineated estimates of primary and old-growth forests outside of strict legal protection equivalent to 2,2 to 2,8 million Ha[R23]. This estimation has a fair amount of reliability. There are additional potential areas outside of strict legal protection e.g. 1,2 million Ha of "continuity" forests, i.e. that have never been clear-cut, and 2,2 million Ha of Annex 1 habitat forests. However, there is insufficient data to estimate the area of primary and old-growth forests within these categories. The majority of strictly protected forests are primary or old-growth forests - 70-90 percent or 1,7 to 2,2 million Ha[8]. Hence, a reliable estimate of total primary and old-growth forest area is between 3,9 and 5 million Ha of which 43-44 percent have strict legal protection. But there are likely further unprotected primary and old-growth forests, perhaps 1 to 2 million Ha, which have not yet been verified and delineated.

**Hence, a minimum assessment of primary and old-growth forest outside of strict legal protection is 2,2 to 2,8 million Ha, of which 1,5 to 1,8 million Ha are on productive forest land. These are the forests that risk being logged.**

The poor legal protection of primary and old-growth forest in Sweden is a result of the national forest legislation only requiring forest owners to retain conservation values up to three to ten percent of the economic value of a clear-felling area[9]. Furthermore, the SFA has declared (in budget requests to the government) that they have insufficient resources for monitoring and controlling legal compliance[R24]. Thirdly, both the SFA and SEPA have in recent years received budget cuts for economic compensation to land owners for both strict protection and management of high conservation areas including primary and old-growth forests. Hence, there is insufficient financing to compensate forest owners to strictly protect primary and old-growth forest beyond the minimum legal obligation. This has caused a situation that increases frustration amongst forest owners and stakeholders such as environmental NGOs, Sámi representatives, local citizens, and nature tourism operators.

In 2020, the forest investigation appointed by the government in 2019 delivered a report with a number of policy proposals[R25]. One of these was that the government should actively promote the strict protection of the last intact primary and old-growth forest landscapes in the northwest of Sweden. The area of productive primary and old-growth forests without strict protection in this region was estimated to be around 525 000 hectares (see Fig. 4). One positive outcome is an ongoing programme with the ambition to transfer 140 000 hectares of these primary and old-growth forests from state forest enterprises to SEPA for strict protection[R26]. However, the current government has shown a low ambition to strictly protect primary and old-growth forests on private lands.

Consequently, Sweden has an ongoing loss of primary and old-growth forests due to clear-cutting. SEPA concluded in 2021 that the annual loss of forests with high conservation value is greater than the rate at which such forests are being put under protection in Sweden[R27]. In the subalpine region alone, some estimates show a loss of up to 3 000 Ha per year between 2002-2017[R28]. For all of Sweden, the NFI estimates an annual loss of around 16 000 Ha of Annex 1 habitats under the EU Habitats Directive - i.e. with a large degree of naturalness which overlaps with primary and old-growth forest. NFI data show that the annual cutting of old forests, as defined according to the national environmental goal[R29], were in the range of 20 000 to 40 000 Ha per year between 1985-2020[R30]. Some research indicates an annual loss of approx. 1,4 percent of continuity forests which have a high likelihood of being classified as old-growth forests[R31].

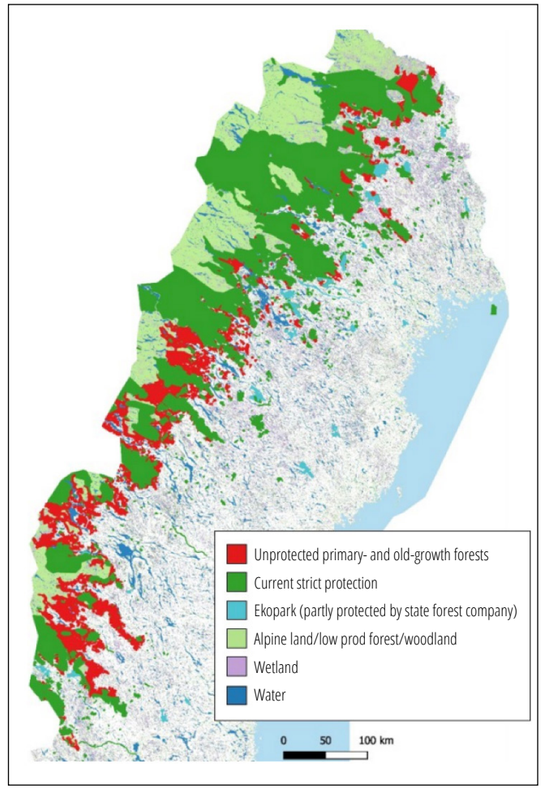


**Figure 4.** Map with the last unprotected primary and old-growth forest landscapes (red areas) in the north-west of Sweden and where forest management would fragment the intactness of the forest landscape. Suggested to be strictly protected by the former government appointed forest investigation in 2019-2020. Map produced by SEPA.

[8] Sweden Public Statistics [R19] and verbal communication with SEPA assuming that 70-90 percent of forests that today are strictly protected are primary and old-growth forests.

[9] The Swedish Forest Agency's application of tolerance levels at different net values of the forest object – see: https://www.skogsstyrelsen.se/globalassets/lag-och-tillsyn/skogsvardslagen/intrangsbegransningskurvan.pdf

# HIGH RISK THAT PROCESSES IN FINLAND AND SWEDEN WILL NOT RESULT IN PROTECTING ALL PRIMARY AND OLD-GROWTH FORESTS

## Ongoing processes

According to the EU guidelines on primary and old-growth forests, methodologies should be science based; developed transparently and shared publicly; ensure cross border harmonisation and consistency with the common definition, and; make it possible to objectively verify fit and appropriate implementation by all relevant forest stakeholders.

## Finland

### Defining the national criteria

In Finland, several different criteria for old-growth forest have been defined and widely used before the publication of the EU Biodiversity Strategy. In 1996, Finland made a resolution on old-growth forest conservation that resulted in the protection of more than 300 000 Ha of forests[R13]. During the 1990s the criteria for Annex 1 habitat type, Western Taiga, were implemented in Finland and they also meet the EU guidelines. Since then, the FSC forest certification system in Finland has included definitions for High Conservation Value Forests. The latest effort has been to define forests that have been protected under the national forest conservation program, METSO, since 2008. All these criteria would meet the EU guidelines for nationally defining national thresholds for old-growth forests. The work by SYKE and LUKE also stated that these criteria for old-growth forest conservation programme, FSC and METSO program meet the EU guidelines as well (see App. 4).

However, the Finnish government did not make use of earlier efforts in defining primary and old-growth forests when developing the government draft criteria, which were put to public consultation during the summer holidays of 2024. The Ministry of the Environment and the Ministry of Agriculture and Forestry drafted the criteria together[R32]. Before opening the public consultation, a draft was leaked from the ministries proposing two different limits/thresholds for forest age and the volume of dead wood. The Ministry of Agriculture and Forestry proposed a significantly higher age threshold, but the proposal from the Ministry of the Environment would also lead to excluding most of Finland's old-growth forests. Thereafter, the draft that the Finnish government put on public consultation was based on the thresholds proposed by the Ministry of Agriculture and Forestry.

The proposed thresholds (see App.4) were so high that even some of the old-growth forests protected back in the 1990s would have been excluded. For example, the government draft criteria are ambiguous on how forest management could disqualify an area. One of the finest primeval forests in Southern Finland is in Pyhä-Häkki National Park where there are many ancient trees, with an unusually old average age of 250 years. However, there are tens of old stumps per Ha[R33], indicating previous cutting, the signs of which are still visible – would this primeval site be disqualified?

The government received a great number of critical responses from several universities, other research institutions, and individual researchers. Also noteworthy is the petition from 450 scientists who stated that the government proposal does not meet the EU guidelines[R34]. Critical statements were given also from the Finnish Nature Panel (that has an official advisory role defined in the Nature Conservation Law) as well as from the regional environmental administration ELY-centers, the Regional Councils, and the Association of Finnish Cities and Municipalities[R35]. All these responses were very critical towards the government's proposal, stating that the thresholds presented were too high to include all the remaining primary and old-growth forests. However, it seems that the government is not going to take into consideration the wide criticism received from the scientific and expert community[10].

The current government has a clear commitment in the governmental program for protecting primary and old-growth forests on state-owned lands: "The government will protect the remaining state-owned old-growth forests that are in their natural state and meet the national criteria. The government will ensure that independent criteria are drawn up within a short timeframe." The government has made a decision to protect 31 000 Ha on state-owned lands[R36]. However, even though the government wanted to proceed swiftly and opened the public consultation for the proposal of the criteria during the summer holidays in 2024, the government has not yet made a decision on national criteria.

[10] On the Finnish government's position on the national criteria stated by the member of the Finnish Parliament representing the Prime Minister party in a panel discussion (https://www.youtube.com/watch?v=Eythb7qPwVI), as well as by the Finnish Ministry of the Environment in stakeholder meetings and in the media on the 15th October, 2024 (https://www.iltalehti.fi/politiikka/a/4edb2e4b-d1d4-4f7d-be91-9756b9f75061).



The Finnish government has prepared a separate definition for primary forests to implement the EUDR in Finland. Based on the statement from the Finnish Environment Institute the government proposal leaves out forests where species dependent on primary forests can thrive[R37].

The Finnish government ordered the framework for defining the national criteria from SYKE and LUKE. This report has been published[R14], and before publishing, the work was presented to some extent to the stakeholders in working groups nominated by the Ministry of the Environment. This work was supposed to be science-based but has been criticized for being guided by the Ministry of Agriculture and Forestry with economic (harvesting) considerations preempting scientific analysis[11]. However, this report did successfully communicate the difference between primary and old-growth forests and especially later in its statement to the Finnish Parliament, SYKE presented a clear idea of the definition of these forests, and the implications for scoping-out the majority of Finland's remaining primary and old-growth forests[R37].

For the forementioned report, as well as several other analyses (such as for national Other Area-Based Effective Conservation Measures areas (OECMs), SYKE as well as regional environmental administrations did not receive data from Metsähallitus on state-owned lands. LUKE analysed NFI data, which gave a good overall picture of the quality and area of primary and old-growth forests, but because of Metsähallitus not sharing the data the researchers were not able to produce as comprehensive conclusions as would otherwise have been possible. So far, only Metsähallitus - the body whose roles include the logging activities within state-owned forests - is conducting analysis on state-owned lands but the work is not yet evaluated transparently, not to mention scientifically. The method for field work was not put on public consultation or discussed with scientists. As a result of this, Metsähallitus alone decides what is measured and how, and finally the areas to be protected are chosen based on this. So far, neither Metsähallitus, nor the Ministry of Environment, nor the Ministry of Agriculture and Forestry, have declared that the mapping conducted by Metsähallitus would be evaluated by the scientific community. They have only stated that Metsähallitus is collecting data that can be utilized once the national criteria for old-growth forests has been decided. The fieldwork is planned to be repeated on sample areas by Tapio, an organization that has specialists from the field but not scientists, and which is significantly financed by the Ministry of Agriculture and Forestry.

Photo 4. Mixed old-growth forest with threatened orchid Goodyera repens. © Sebastian Kirppu

[11] An article by Finnish broadcasting company, YLE, cites: researcher Kimmo Syrjänen (Project Leader, SYKE): There's a search for strict criteria, despite us already having good existing guidance for inventories". In the same article, Katja Matveinen (Chief Specialist, Ministry of Agriculture and Forestry) is cited as saying: "We have been discussing, what kind of findings have the researchers made and what we want to include in the definitions, what are important in order to achieve a coherent entity." The interviewer asks, "Isn't that directing?", apparently receiving the response, "Well, it could be, if we keep at it" [874].

For more on criteria, see “Mapping” (below), with regards to the methodology being deployed in the mapping undertaken by Metsähallitus.

### Mapping

The government of Finland, via Metsähallitus, has started mapping primary and old-growth forests on state-owned lands. This is a waste of taxpayers money since most of the state-owned primary and old-growth forests have already been mapped by Metsähallitus as well as by two different working groups - the Natural Forest Working Group and the Forest Mapping Team Sápmi (whose work has been financed by Kone Foundation)[R16]. The government is wasting four million euros to re-map areas that have previously been mapped[R38].

Metsähallitus has not published any information from the mapped sites, but they have informed the public about the methods they are utilizing for the field work. For example, they are not measuring the age of the oldest trees in the forest but rather the average age of the largest cohort of trees in the forest - which creates an unscientific age estimation for old-growth forests as old-growth forests vary widely in the number of trees at different age-class categories, based on a range of factors. Average age of the dominant tree cohort has not been presented as a criteria of old-growth forests in the EU guidelines, which rather alludes to “presence of old or large trees”. This will exclude forests that would be classified as old-growth forests were a more scientifically sound methodology to be used. A more profound evaluation of their work can be done once Metsähallitus has published the results, possibly at the end of 2025. However, they expect the work to be prolonged until 2026.

The Sámi Parliament demands that the Finnish government accepts the criteria utilized by the Forest Mapping Team Sápmi and that a separate process must be conducted on the protection of primary and old-growth forests in the Sámi homeland[R39]. In addition to mapping more areas, there are also areas on Sámi lands that have been part of a 20-year preservation contract between the Sámi and the government. It is uncertain whether these contracts will be renewed. Clearly these areas should meet the primary and old-growth forest criteria based on the EU guidelines.

In Finland, primary and old-growth forests on private lands have never been systematically mapped and it seems that the government is not willing to do this. This is not in line with the member states’ commitments under the EU Biodiversity Strategy. If these forests are not mapped by the government, private forest owners and forest companies will incur the costs of having to identify primary and old-growth forests themselves in order to comply with EU legislation (such as REDiii and EUDR). However, there is strong evidence based on NFI data that in Finland a great majority of the remaining unprotected primary and old-growth forests are located on state-owned lands. Although private lands have not been systematically mapped, based on the open forest information administered by the Finnish Forest Centre most of the forests to the South of Lapland have been intensively managed. It is clear that there is a great need for restoration in the private forest estate, to increase its contribution to the network of forests exhibiting valuable qualities of old-growth, for instance through set-aside.

### Protection

It is not probable that companies and private forest owners will take responsibility for identifying and protecting primary and old-growth forests, as so far, forest protection has been implemented with the state budget rather than with finance from forest companies. Recently, the voluntary METSO conservation program has received budget cuts and it is not functioning well in terms of responding to the national goals and the vast interest of the forest owners to protect more of their forest. Private forest owners are even willing to protect their forest without compensation, but to a rather minimal extent. On the other hand, several forest owners are willing to protect their forest for a smaller compensation than what they would gain by selling wood[R40]. The negligence of the Finnish government to act on this, could lead to the logging of primary and old-growth forests which have so far survived on private lands.

Several environmental organizations, including WWF, have proposed to forest companies to demand that the government decides to protect the state-owned primary and old-growth forests that have already been identified consistently with the EU guidelines. However, so far there has been no public support from any of the companies.

### Monitoring

Finland has a well-functioning National Forest Inventory (NFI) system that provides information on the area of forest based on their age as well as some criteria that can be utilized in terms of identifying the naturalness of a forest. Based on this data, Finland has been losing forests of old age up until 2021[R17]. The NFI is not qualified to meet the need to map and monitor all primary and old-growth forests, but the NFI data can be utilized for overall analyses but it does not provide information on particular forest sites, beyond its sampling sites. Site level data can be acquired from aerial images and LIDAR data that is governed by the Finnish Forest Center. This data has not been utilized for conservation planning in Finland, for which the Forest Center would need to be required to do so by legislation. Up to now, Finland has mainly utilized this data for forestry purposes. Thus, this highlights the importance of the proposed EU Forest Monitoring Law that would allow us to utilize forest data for various different purposes, such as forest protection, including primary and old-growth forests. The current status-quo on the governance, utilization and development of forest data is a significant form of abuse of power. Finland has not started any efforts to organize the monitoring of the condition and status of primary and old-growth forests[12].

## Sweden

In Sweden there are a number of ongoing national processes that relate directly or indirectly to the EU ambition to define, map, monitor and protect primary and old-growth forests. In Appendix 1 there is a list of processes, including identified challenges. Many of these processes will report to the government during the period December 2024-February 2025. However, other processes stretch into 2026, e.g. national implementation of the Nature Restoration Law. Some processes have delivered draft proposals which contradict each other and/or are not in compliance with EU policies. Today it is nearly impossible to see how the government is to integrate all this into effective and credible governance. One reason for this is a clear tendency of unwillingness by the Swedish government to protect more forests or to change forest management practices.

One recent example that showcases the low ambition of the government is the instruction to SEPA, in December 2024, stipulating that the reference baseline area for Annex 1 habitats according to the Habitat directive should be changed from pre-industrial to 1995 - i.e. Sweden’s entry to the EU. This would imply that Sweden would not have to restore any further forest area to favorable conservation status regardless of what is necessary to preserve biodiversity based on science. Furthermore, the instruction could lead to altering the classification of Annex 1 forest habitats and allowing further clear-cutting of primary and old-growth forests (see Appendix 1). In short, if these concerns are realized, the NRL would become meaningless in terms of restoring and preserving Swedish forest ecosystems.

Hence, the government approach related to primary and old-growth forests causes confusion and cannot be claimed to follow the EU guidelines in terms of transparency, participation, harmonization, or of being scientifically based.

### Moratorium & Protection

The Swedish government is not, as the EU guidelines require, taking a precautionary approach and is not imposing a moratorium on the cutting of primary and old-growth forests. Primarily, it is the 1,5 to 1,8 million Ha of unprotected productive primary and old-growth forests that are at risk of logging. As described, there is a political unwillingness to protect more forests in Sweden. The legal system is weak and there is not sufficient government funding to protect primary and old-growth forests. Consequently, thousands of hectares of these forests are cut each year. The lack of willingness by the government to hinder the continued logging of forests with high conservation value also causes tension within voluntary market driven systems.

For instance, due to the increase in number of complaints, FSC International commissioned Accreditation Service International to assess the old-growth forest situation in Sweden in 2023, the “Swedish Old-growth Forests Integrity Investigation Report”. The assessment concluded that important drivers for the increase in complaints were related to the cessation of wood land key habitat delineation by the SFA on private lands and the reduction of government funding to compensate forest landowners for conservation set-asides[R41].

### National definitions & criteria

There are two ongoing parallel national processes that directly relate to the national definition and criteria of primary and old-growth forests (see Appendix 1), but contradict each other in approach. One of these processes attempts to follow the EU guidelines whilst the other ignores important key aspects of the guidelines.

The first of these processes is the parliamentary process of the Environmental Objectives Committee (Miljömålsberedningen), which has seen the SFA and SEPA deliver a preliminary assessment of the area of primary and old-growth forests in Sweden, making a serious attempt to follow the EU guidelines[R23]. This assessment takes the approach of using existing definitions and criteria, such as forests categorised under Annex 1 of the Habitats Directive, woodland key habitats, continuity forests[13], of which some are delineated and mapped and some are not. Based on these categories, estimations were made of primary and old-growth forests in consultation with experts and researchers.

The second process is related to the national implementation of land-use criteria in the Renewable Energy Directive (REDiii), the aim being to ensure the EC can endorse Sweden as having the requisite legislation, monitoring and control to comply with the directive. The government more-or-less dictated the expected outcomes the SFA should propose. It was also clear in the government’s instructions to the SFA that the authority should not fully implement the EU guidelines on primary and old-growth forests during this process[R42]. The SFA was not to consider old-growth forest as understood in relation to the EU’s Biodiversity Strategy (i.e. elaborated by the EU guidelines on primary and old-growth forests) - where in the Swedish translation of the strategy it is referred to as “naturskog”, but instead, as it is defined in relation to the Swedish translation of REDiii, i.e. “gammal skog”[14]. Furthermore, the SFA was only to consider sections 2.2

[12] ...except where they overlap with Habitats Dir Art. 17 reporting, in which, however, they are not identified as being primary or old-growth forests, so there is effectively no monitoring of primary and old-growth forests.

[13] Annex 1 habitat classified forests - Forests habitat classified reported under article 17 of EU’s Habitats Directive. Woodland Key Habitat - A forest area that, based on a comprehensive assessment of the biotope’s structure, species content, history, and physical environment, is of great importance for the forest’s flora and fauna. Red-listed species are present or can be expected to be found there. Continuity forest - A forest that has natural values whose occurrence is explained by the fact that suitable forest environments and substrates have existed in this forest or its vicinity for a long time.”

[14] In the translations of EU policies sometimes old-growth forests have been translated to “naturskog” (natural forests), e.g. EU Biodiversity Strategy, and sometimes to “gammal skog” (old forests). This also raises the question as to whether a Member State can interpret the terms primary and old-growth forests differently under different EU policies and legislation.

and 2.3 (regarding definitions of primary and old-growth forests) and ignore the rest of the guidelines, which implied ignoring the EU's guidance on how to choose and consider criteria (section 2.4).

Consequently, this led the SFA to propose to the government criteria for "gammal skog" (see Appendix 3) which excludes much of the high conservation value forests which would have been included had the EU guidelines been followed and had a scientific approach been used. In short, the introduction of rigid and unscientific "must" criteria, e.g. for average stand age or deadwood, ignores the natural continuity, succession and variation that causes species richness and will exclude many forests with high conservation value.

Fig. 4 provides concrete examples of forests of high conservation value that would probably be classified as old-growth forests in a scientifically sound process, but that will likely not meet the suggested national REDiii criteria for old-growth forests.

The striking differences in criteria proposed by these two processes results in a large discrepancy in the estimated area of primary and old-growth forests. According to the estimate to the Environmental Objective Committee's process, the area of primary and old-growth forest on productive forest land outside of strict protection is (at least) 1,5 to 1,8 million Ha. Using criteria suggested for national REDiii implementation, the estimated area of primary forests and "gammal skog" on productive forest land outside of strict protection is estimated to be 200 000 to 500 000 Ha.

In conclusion, the suggested criteria for "gammal skog" do not follow EU guidelines on primary and old-growth forest and can only be considered to cover a Swedish subset of primary and old-growth forests - excluding significant areas of these forests that are relevant to EU policies and regulations as well as previous work on high conservation value forest types in Sweden.

## Mapping

The report by the SFA and SEPA to the Environmental Objective Committee uses existing inventories and delineated areas, e.g. Figure 4. However, in the more southern regions of the country, inventories and delineation is lacking and, hence, whilst top-down estimations of the likely distribution of primary and old-growth forests can be made, further investigations are needed to verify.

The suggested criteria for national REDiii implementation allow for only indicative estimates. This is because they do not follow previous criteria used by authorities to identify forests with conservation value, and by setting the bar higher can only represent a subset of forests with high conservation value in existing inventories.

There is today no official public map of potential primary and old-growth forests, but there are independent initiatives such as a prediction map of forests with high conservation value developed by researchers[15], and the mapping conducted by Protect the Forest Sweden[16]. Researchers have proven that a combination of remote sensing, inventory data, and modelling, is a reliable and efficient approach to creating high probability maps of conservation values in forests. Using a high conservation value probability of >70 percent (0,7) they estimated a forest area of about 3,5 million Ha of which about 52 percent are currently strictly protected. Using a probability of 0,5, the area of forests with high conservation value would increase to about 6,2 million Ha[17]. Such mapping is helpful to guide the national inventory and optimize resources for the field-verification of primary and old-growth forests.

## Monitoring

There is no coherent and coordinated government effort to monitor primary and old-growth forests in Sweden. As long as criteria are not set, consistent identification, mapping and monitoring is not possible. However, the already referred to SEPA and SFA report to the Environmental Objective Committee identifies the likelihood of a large overlap between primary/old-growth forests and forest habitats which are Annex 1 classified, monitored and reported under the EU Habitats Directive.

To some extent the SEPA and SFA also monitor changes, e.g. loss of forests that potentially could be classified as primary and old-growth forests. The Swedish NFI identifies in their plots if forests fulfill Annex 1 habitat quality and, hence, provide area estimates and changes over time for the most common forest types. For instance, SEPA concluded in 2021 that the annual loss of high conservation value forests is greater than the rate of protection of such forests in Sweden[R27]. As mentioned in the previous section there is also a non-governmental mapping and monitoring website of potential primary and old-growth forests and loss in forest cover.

The criteria being advanced in Sweden for national REDiii implementation should only be interpreted as representing a subset of forests with high conservation value, as they only allow indicative estimates of primary forests and "gammal skog" (but not old-growth forests) and are not aligned with past forest inventories by authorities, e.g. the NFI.

Systematic fieldwork is needed to produce the final, ground-checked maps, and to undertake monitoring.

[15] Scientists' likelihood map of high conservation forests in Sweden, here - based on research by Svensson, J., Bubnicki, J.W., Jonsson, B.G., Andersson, J. & Mikusiński[R75]

[16] Protect the Forest Sweden's likelihood map of continuity forests, here[R76]

[17] Forest Nature Value Map, here (SEPA report 7136[R77]), and communication with Professor Bengt-Gunnar Jonsson



# FINANCING

## Finland

The national budget for nature conservation has been low in Finland but the previous government (2019 - 2023) temporarily increased the budget by 100 million euros. The current government came into power in June 2023 and made budget cuts which not only eliminated the additional funding but also reduced the so-called basic nature conservation budget. For the year 2025, Finland has about 37 million euros for establishing protected areas. This is contradictory politics since the majority of Finnish people as well as the majority of forest owners want to have more forest protection.

Finland has a well-functioning voluntary forest conservation program, METSO[R43], but it lacks funding. Forest owners would like to protect much more forest than the government is willing to fund. Hence, the protection of primary and old-growth forests would increase if there was finance for compensation.

There is potential for funding to become available for the protection of primary and old-growth forests through a process the Finnish government has started to revise the Nature Conservation Act to integrate the use of biodiversity credits as well as the National Register for Biodiversity Offsetting, for purposes beyond just the offsetting of harm[R44]. WWF acknowledges this development[R45] but wants to highlight that additional ways of increasing the funding for forest protection are urgently needed.

## Sweden

The resources in the state budget to support more forest protection have been greatly reduced over the last years and the decrease seems to continue. Representatives of ruling parties publicly state that they do not want to see more strict protection of forests[R46]. However, it is a politically contradicting context since the Minister of Climate and Environment has made public claims that high conservation value forests should be protected but this is not mirrored in government efforts. For instance, the government budget to SEPA and SFA for strict protection of nature decreased by 30 percent between 2022 and 2023 (approx 144 million Euro to 101 million)[R47]. In 2024, there was an increase of 19 million euros in the SEPA budget for land compensation. However, for SEPAs 2025-2026 budget for nature protection, the government has declared a 30 percent decrease and then a further decrease of 42 percent in 2027[R48].

Government financing for strict protection is far below what is needed. Further, the uneven resourcing across funding periods causes great problems in establishing long term continuity of the protection work by SEPA and SFA.
At the same time, inflation and increased prices of forest land has made strict protection more costly. In general, forest owners receive 125 percent of the market value from the government when their forest is strictly protected. However, the state budget is insufficient which causes delay and frustration amongst forest owners. The cost for tax payers for strict protection of forests increases with the rise of market value of forest land.

# EXAMPLES OF THREATS TO PRIMARY AND OLD-GROWTH FORESTS IN SWEDEN

Different independent assessments estimate that thousands of hectares of primary and old-growth forests are clear-cut annually in Sweden. To illustrate this we collected a number of concrete cases illustrating old-growth forests that have been notified for felling but which likely would not be classified as old-growth forests using the suggested criteria for old-growth forests under the national implementation of REDiii (see Fig. 5).

Fig. 5 illustrates that if not following the EU guidelines in developing sound scientific criteria you are likely to create a system for mapping and protection which does not achieve the goals of the EU Green Deal. In the Swedish REDiii case, setting a "must" criteria with a very high threshold for average stand age, will likely disqualify a pine forest that has never before been clear-cut, but was regenerated after a forest fire 80 years ago. Such a forest stand would today have a dominating pine stand of 70-80 years but with fewer bigger and older standing trees that may have an age of 180 years. Is it reasonable to disqualify such a stand from being an old-growth forest, even though stand continuity, old trees, deadwood and red listed species tell otherwise?

Research shows that studied Swedish woodland key habitat - valuable habitats which according to SEPA and SFA overlap with old-growth forest if EU guidelines are followed, have an average of approx. 20 $m^3$/Ha coarse dead wood (standing and lying) with a range of 0-163 $m^3$/Ha[R49]. This average is also confirmed in other studies. Research by Hekkala et al also indicates a threshold of about 20 $m^3$/Ha above which species diversity and number of red listed species increases[R50]. Hence, setting a threshold of 30-50 $m^3$/Ha (as currently proposed - see App. 4) would exclude large areas of continuity forests that have the potential to host red-listed and threatened species associated with old-growth.

Photo 5. Old pine *(Pinus sylvestris)* in Northern Finland. © Wild Wonders of Europe / Widstrand / WWF

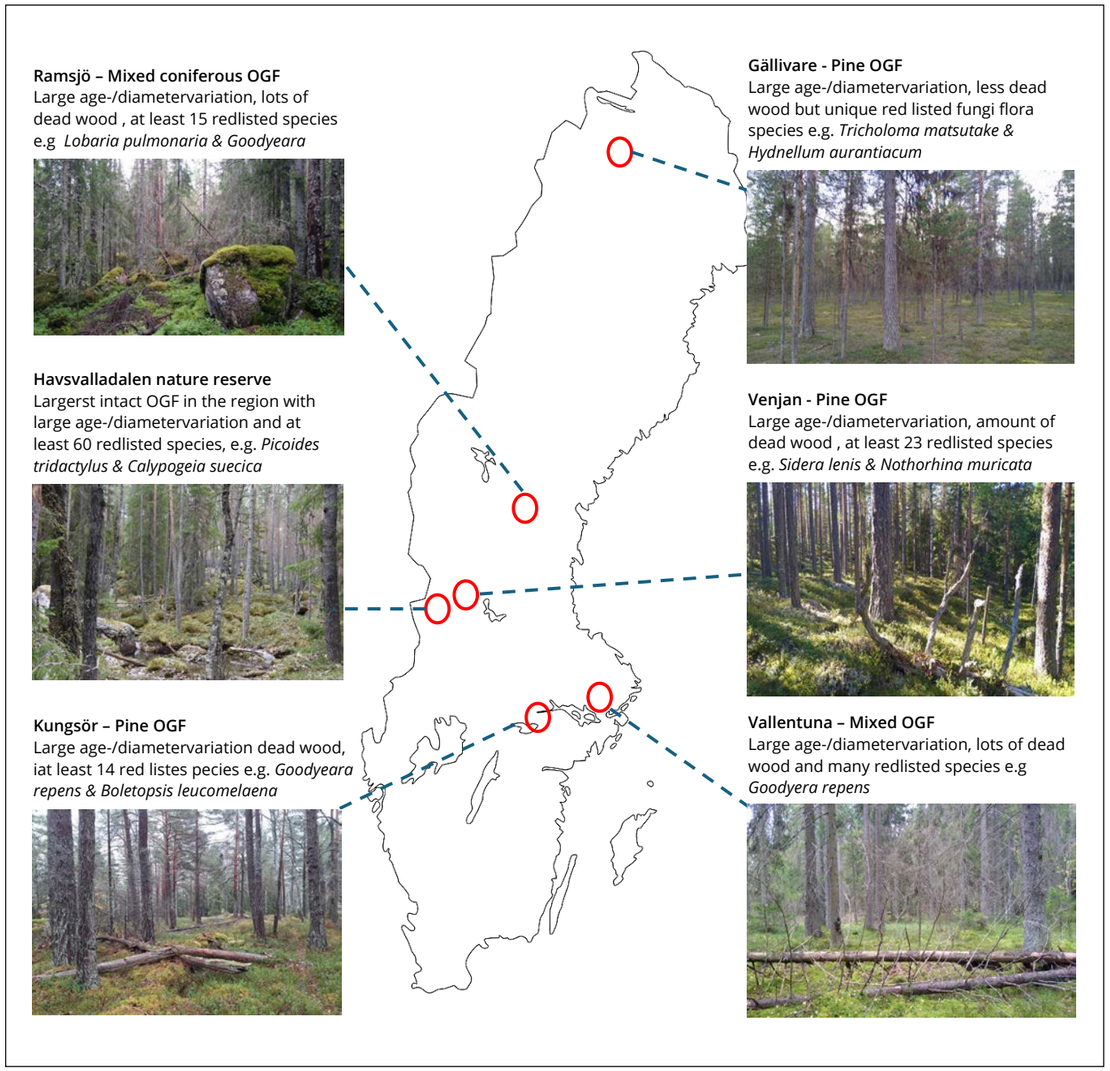


**Figure 5.** Examples of Swedish old-growth forests which were notified for felling and would not meet old-growth forest thresholds under suggested Swedish REDiii implementation (see Appendix 3)[18]. N.B. Many of these forests were not logged after action from the eNGO community. Stand information and photos © Sebastian Kirppu

[18] Regarding Havsvalladalen, the nature reserve was established after the notification of felling around 2002. Today the nature reserve amounts to about 1 600 ha and encompasses the largest intact old-growth forest in the region. The plan for the nature reserve with information on conservation values can be found here.

# CONSEQUENCES OF POLICY FAILURE AND WWF'S RECOMMENDATIONS

Although we do not yet know the end results of policy development in Sweden and Finland, the current signals from both governments are clear; they are aiming to set the qualification bar so high so that mapping and protection of primary and old-growth forests is maintained at a minimum. To this end, flexibilities and loopholes in Green Deal policies and legislation are being exploited.

If these positions are maintained there will likely be repercussions at different levels. The lack of protection and ongoing logging is threatening the last remaining unprotected primary and old-growth forests, undermining biodiversity, forest resilience, ecosystem services (e.g. carbon sequestration, hydrological regulation, etc), and the viability of the Sámi people's way of life. These forest losses also affect other economic operators such as tourism companies and Sámi reindeer herding. The GDP share from tourism in Sweden is about 1,9 percent[R51] and nature tourism is one of the fastest growing segments[R52]. However, "no one wants to visit a clear cut", as stated by Jessica Sannö, political spokesperson for The Swedish Nature and Ecotourism Association[R53].

International commitments regarding climate and biodiversity will not be met. The development of a sustainable society, with genuine bioeconomy and circular economy, will be seriously undermined. Furthermore, lack of responsibility and contribution by governments to protect primary and old-growth forests makes it not only more difficult for companies to source legally compliant biomass but also to meet market expectations on sustainability. It increases the burden on voluntary certification systems, e.g. FSC, to solve problems when governments choose not to. FSC International noted in a recent report the negative impact on the certification system due to the failing of the Swedish government and authorities to take their responsibility in delineating and protecting old-growth forests[R41]. Difficulties in filling this governance gap could lead to the failure of existing market systems and undermine the credibility of nordic forest products on the international market. Tension between stakeholders is likely to amplify, e.g. between the Sámi people, forest owners and the forest companies. Clear-cutting of primary and old-growth forests is a significant threat to Sámi reindeer herding and culture[R54]. Tension between forest companies and the rest of the society might also increase. Governmental decisions are very likely going to be challenged in EU-court cases. So conflicts and tensions are rising on many levels in the societies of Finland and Sweden.

Last but not least, there is a large discrepancy between political rhetoric, policy and what is happening on the ground, which undermines the credibility of policymakers in the public eye. If ambitious Green Deal policies have been decided which are not matched with implementation, sooner or later it will negatively affect the trust of the general public with regard to both national governments and the EU. This points to the need for the EC to monitor and enforce the implementation of regulations in member states, if need be, addressing non-compliance in the EU Court of Justice.

## Recommendations to Swedish and Finnish governments

The Swedish and Finnish governments need to recognize the scientific basis for what is needed to maintain biodiversity and increased resilience in forests. There are conflicting goals in societies today which transparently need to be addressed with the best available knowledge. Understanding the ecology and function of our ecosystems and how they are affected by human intervention is fundamental to achieving a sustainable circular bioeconomy. Furthermore, it is crucial that international agreements and EU policies regarding biodiversity and climate are mirrored in government actions. Hence, national governments in Finland and Sweden should:

- Fully embrace and implement the ambitions regarding the protection of forests with high conservation value including primary and old-growth forests in accordance with international agreements and EU policies, including strategies, directives, legislation and guidelines.

- Ensure a robust scientific basis to national policy development: e.g. Sweden should (as Finland has) establish a national scientific advisory group on biodiversity including forests, and such bodies should be listened to, rather than be dictated to according to political goals.

- Comply with EU guidelines regarding a stakeholder-inclusive and transparent process for developing scientifically sound criteria, mapping, monitoring and strictly protecting primary and old-growth forests.

- Integrate, and harmonise across member states, the classification and mapping of primary and old-growth forests with Annex 1 forest classifications under the Habitat Directive. This must be conducted as part of the implementation of the NRL in terms of protecting forests that have favourable conservation status and restoring forest habitats with unfavourable conservation status.

- Ensure that the Council discussions on the proposed Forest Monitoring Law (FML) contribute to the passing of a robust FML that includes, as in the EC's proposal[R55], the indicator of "location of primary and old-growth forests", as well as adding monitoring of their condition.

- Implement a precautionary approach and impose a moratorium of logging in forests that have a likelihood of being primary or old-growth forests until verified by field investigations.

- Identify gaps in the mapping and inventories of primary and old-growth forests and dedicate government resources to fill these gaps.

- Produce data on the impacts on society of protecting as well as not protecting primary and old-growth forests, such as: how many and what kind of private forest owners have primary and old-growth forests and how big these areas are; the ecosystem services provided by primary and old-growth forests; etc.

- Respect the rights of the Sámi people. The Sámi have the right to be consulted and negotiate with the Swedish and Finnish governments. In Finland, the Sámi Parliament has proposed to the government to have a separate process on Sámi homeland with regards to primary and old-growth forests.

- Strengthen the legal framework to protect primary and old-growth forests in combination with a long term financing strategy to compensate land owners. Explore the possibility of establishing a government and market shared fund to financially compensate forest owners.

## Recommendations to the European Commission, from a Swedish and Finnish context

For WWF Finland and WWF Sweden it is of importance that policy ambitions at EU-level are implemented at national level.

This report focuses on national processes in Sweden and Finland that relate to the mapping and protection of the last remains of primary and old-growth forests in Europe. The European Commission (EC) is instrumental in achieving this, therefore recommendations are given below[19]:

- There is a need for regular monitoring of the status and development of primary and old-growth forests, in cooperation with a variety of stakeholders. This includes the monitoring of proper national application and enforcement of processes developed at EU level with the national governments and different stakeholders, with regards the EU-guidelines on old-growth forests and relevant EU legislation; and identification of additional measures, including legal obligations, in order to achieve the desired outcomes.

- Urgently explore different mechanisms to finance the mapping, monitoring and protecting of primary and old-growth forests together with the national governments, forest owners, companies and stakeholders.

## Recommendations to companies with interests in Swedish and Finnish forests

Companies along the value chains of different forest products have a shared responsibility to identify and protect primary and old-growth forests. This includes producers, buyers (domestically and internationally) and investors. If governments fail at taking responsibility, companies need to step up. Companies should:

- Push governments in member states to (credibly) implement international agreements and EU policies in order to protect high conservation value forests including primary and old-growth forests.

- Actively engage in credible market certification systems, both internationally and nationally, with the aim of strengthening certifications' effectiveness in protecting forests of high conservation value including primary and old-growth forests.

- Openly challenge other companies that undermine further protection of primary and old-growth forests.

- Publicly commit to not sourcing from high conservation value forests including primary and old-growth forests in Europe and globally, and take additional measures to ensure that sourcing does not include biomass from these forests.

- Together with stakeholders, governments and the EC, urgently explore the development of shared financial mechanisms to map, verify, and particularly to protect primary and old-growth forests.

[19] It could be that these recommendations are more generically applicable to other member states also, but that is beyond the scope of this report.

# APPENDIX 1

## Overview of ongoing Swedish processes that directly or indirectly relate to EU policies regarding primary and old-growth forests

| EU Policy | Swedish govt processes | Final reporting | WWF assessment |
|---|---|---|---|
| **EUDR** | Government (govt) investigation on adaptation of Swedish law to the EU's deforestation regulation[R56] | 14 Feb 2025 | Measures will be proposed to ensure that Sweden will be a low risk country. In EUDR, primary forests are not to be degraded. EUDR does not rule out materials from primary forests. |
| **REDiii – Land use criteria** | SFA investigation to government[R57] | Reported to govt | Deviation from EU guidelines - no sound, transparent and scientific process for defining criteria and thresholds for primary and old-growth forests. |
| | Assessment at Ministry of Rural Affairs and Infrastructure | Ongoing | In general, risk of greenwashing the legality, monitoring and control of REDiii land-use criteria. |
| | Public referral | Jan 2025? | |
| **Biodiversity Strategy & LULUCF** | Govt directive to Environmental Objective Committee to develop proposals to implement LULUCF & biodiversity strategy [R58,59] | Report to govt 14 Feb, 2025 | SFA and EPA has delivered first credible assessment of primary and old-growth forest area in Sweden consistent with EU guidelines.<br><br>The protection of primary and old-growth forests in Sweden is highly relevant, but neglected, to achieving the national LULUCF target.<br><br>High risk that political negotiations will align with REDiii criteria and thresholds, and thus deviate from EU guidelines.<br><br>High risk that political negotiations will undermine the possibility of achieving LULUCF target. |
| **Review of national protection of species** | Government investigation led by Ministry of Climate and Enterprise to make changes in legislation to protect species | Dec-Jan, 2024/5 | Links indirectly to the protection of primary and old-growth forests due to red-listed forest habitats and species |
| **Nature Restoration Law & Annex 1 forest habitats according to Habitat directive** | SEPA report to the government on reference area for habitats estimated pre-industrial or 1995[R60] | March, 2024 | The govt message to SEPA is:<br>• Achieve restrained reporting to achieve improved competitiveness and reduced regulatory burden<br>• 1995 should be the reference area and not as previously reported pre-industrial, i.e. mid/end 1800.<br>• The criteria and area to achieve favorable conservation for forest habitats should be revised (i.e. lowered).<br><br>Consequences would be that Sweden does not need to restore any forest types and risks further deterioration of Annex 1 forest habitats including primary and old-growth forests.<br><br>Today Annex 1 forest habitats are estimated to be clear-cut at a rate of 16 000 Ha/year[R63]. |
| | SEPA report proposed process to develop national NRL plan[R61] | Nov, 2024 | |
| | Government instruction to SEPA for implementation of Annex 1 habitat reporting and NRL[R62] | Dec, 2024 | |
| **Forest Monitoring Law (FML)** | The government of Sweden opposes many of the proposed objectives and indicators issues in the EC's proposal for a FML. | | The EC proposal for a FML would clarify the requirement 'to map and make publicly viewable the location of all primary and old-growth forests, assisting the achievement of an EU-coordinated approach. |



# APPENDIX 2

## Overview of ongoing Finnish processes that directly or indirectly relate to EU policies regarding primary and old-growth forests

| EU Policy | Finnish government process | Comment |
|---|---|---|
| **EUDR** | The govt is defining EUDR-relevant criteria for primary forests in a separate process to the EU Biodiversity Strategy/EC guidelines.<br><br>Public consultation during summer 2024. | Finland's application of the EUDR is not expected to prevent the clear-cutting of primary forests as the criteria presented in the public consultation during the 2024 summer holidays would exclude part of Finland's primary forests.<br><br>Finland's EUDR process of defining/identifying primary forest is not consistent with the EU Biodiversity Strategy/EC guidelines.<br><br>The EC should seriously examine the risks in Finland. |
| **Land-use criteria in RED** | There has been no separate process to implement REDiii criteria on primary and old-growth forests in Finland. Instead the government seems to aim at defining the national criteria for old-growth in such a way that almost no forests would meet the criteria and thus there would be no need for considering these forests in the implementation of REDiii.<br><br>The Finnish Association of Nature Conservation was a member in a working group nominated by the Finnish Ministry of Agriculture and Forestry that worked on a report on the land-use criteria for REDiii. They gave a dissenting opinion on the report, stating their concern that Finland's approach would not prevent the degradation of primary and old-growth forests (i.e. their conversion to planted forest or plantations. | Finland's RED process of defining/identifying primary and old-growth forest is not consistent with the EU Biodiversity Strategy/EC guidelines if the national criteria will not meet EC guidelines.<br><br>If the Govt of Finland fails to define science-based criteria for primary and old-growth forests, the implementation of REDiii will fail. |
| **Biodiversity Strategy & LULUCF** | The Govt of Finland does not acknowledge the protection of primary and old-growth forests as part of maintenance of carbon sinks. The Govt of Finland focuses on increasing logging, logging younger forests, & adding fertiliser to increase tree growth. | The Natural Resources Institute Finland (Luke) has provided a policy brief on the importance of old forests as carbon sinks[R64].<br><br>Noteworthy is the relatively high share of deadwood of the total carbon emission reduction. |
| **Habitats Directive & Nature Restoration Law (NRL)** | Ongoing process to define the Annex 1 favorable reference area by SYKE.<br><br>Ongoing process of the three scientific panels in Finland to publish a report on implementation of the NRL (the Finnish Nature Panel, the Climate Panel, and the Finnish Panel for Bioeconomy) to be published in Jan-Feb 2025. | Considering the strong resistance against protecting the remaining primary and old-growth forests it is likely that setting a goal for restoring degraded old-growth forests will not be straightforward, especially with lack of finance. |
| **Program of the Finnish Government** | The commitment in the government program: "The Government will protect the remaining state-owned old-growth forests that are in their natural state and meet the national criteria. The Government will ensure that independent criteria are drawn up within a short time frame." | The Govt of Finland has carefully chosen the wording for this commitment as to protect "natural, old-growth forests" which would mean different to primary forests and old-growth forests.<br><br>The Government of Finland has presented a decision to protect 31 000 Ha of these forests which is clearly less than the area mapped that meets the EC guidelines = at least 700 000 Ha known, and more to be mapped (in Sámi homeland). |
| **Forest Monitoring Law (FML)** | The Government of Finland opposes many of the objectives and indicators in the EC's proposal for a FML, stating that Finland already has a good monitoring system[R65]. | The EC proposal for a FML would clarify the requirement to map and make publicly viewable the location of all primary and old-growth forests visible, thus making it mandatory for Finland to also map its private forests. |

# APPENDIX 3

## Old-growth forest definition, criteria and thresholds suggested by the Swedish Forest Agency regarding national fulfillment of the Renewable Energy Directive (REDiii)

For reference, see[R57].

**Definition**

Forest stand or forest area:

1. of very high age, and
2. consisting of native tree species that, mainly through natural processes, have developed structures and dynamics normally associated with late successional stages of primeval or undisturbed forest of the same type; there may be visible signs of previous human impact, but these gradually disappear or are too limited to significantly disrupt the natural processes.

**Suggested-but-not-officially-confirmed criteria under national implementation of REDiii**

Criteria and thresholds (a-e) all have to be fulfilled:

a. The forest consists of native tree species. A limited presence of non-native tree species does not disqualify the forest from being classified as old-growth forest, provided that the presence does not significantly impact the ecological processes.

b. Stands dominated by coniferous or noble broadleaf trees:

- The basal area-weighted average age in the stand is ≥180 years in northern Sweden or ≥160 years in southern Sweden,
- OR the oldest tree layer, consisting of a large number of individual trees per hectare, has reached an age of ≥200 years in northern Sweden or ≥180 years in southern Sweden.

Stands dominated by other broadleaf trees:

- The basal area-weighted average age in the stand is ≥120 years,
- OR the oldest tree layer, consisting of a large number of individual trees per hectare, has reached an age of ≥140 years.

c. Pristine condition

The forest has primarily developed through natural processes over a long period, and in the area, no or only insignificant logging has occurred in the past 30 years. Additionally, there are no traces of stand-replacing forestry measures in the area over the past 80 years.

d. Deadwood

In the area, deadwood is present in various stages of decomposition.

e. Area

To qualify as an old-growth forest, the stand must cover an area of ≥ 0.5 ha.

Supplementary criteria (f-i) of which at least two need to be met to be classified as old-growth forest provided a to e are met:

f. Deadwood - Volume

- There is a total of ≥20 $m^3$ of deadwood older than one year per hectare,
- OR ≥10 $m^3$/ha of lying or standing deadwood, of which 20 pieces/ha are ≥20 cm in diameter.

g. Multi-layering / Large Diameter Distribution

- The forest is multi-layered,
- OR the forest has a large diameter distribution,
- OR the forest is uneven-aged.

h. Trees of special importance

- At least 20 stems per hectare of trees with very high age, large trees with a diameter at breast height of ≥60 cm, hollow trees, or trees with visible fire scars.

By very high age, it is meant:

- Pine ≥250 years in northern Sweden and ≥200 years in southern Sweden.
- Spruce ≥200 years in northern Sweden and ≥180 years in southern Sweden.
- Oak or beech ≥200 years
    - Other broadleaf trees >150 year
    - Conservation Species
    - Other broadleaf trees >150 year
    - Conservation Species

i. The forest has an abundant presence of conservation species associated with old-growth forests.

# APPENDIX 4

## The draft national criteria of the government of Finland for old-growth forest in Finland

WWF Finland together with the Kone Foundation have translated the draft criteria that the government of Finland put on public consultation during summer holidays in 2024, viewable in full here [R32], and summarized (in part) in this Appendix.

Two contrasting sets of criteria were proposed by the Ministry of Agriculture and Forestry, and the Ministry of the Environment, differing markedly in their thresholds on forest age and volume of deadwood. The government of Finland then chose to put on public consultation the version of the Ministry of Agriculture and Forestry.

## The average age of the dominant tree stand is at least:

**The Ministry of the Environment's proposal:**

| Age (years) | Forest vegetation zone | | | |
|---|---|---|---|---|
| | Southern and hemiboreal | Middle boreal | Northern boreal, south (4a–4b) | Forest and Fell Lapland (4c–4d) |
| **Age, coniferous** | 120 | 120 | 140 | 160 |
| **Age, deciduous** | 80 | 80 | 100 | 100 |

**The Ministry of Agriculture and Forestry of Finland's proposal:**

| Age (years) | Forest vegetation zone | | | |
|---|---|---|---|---|
| | Southern and hemiboreal | Middle boreal | Northern boreal, south (4a–4b) | Forest and Fell Lapland (4c–4d) |
| **Age, coniferous** | 140 | 140 | 160 | 200 |
| **Age, deciduous** | 100 | 100 | 140 | 140 |

## The minimum amount of deadwood is:

**The Ministry of the Environment's proposal:**

- Dead standing trees and lying deadwood in different stages of decay constitute either at least 10% of the total natural tree stand or 20 $m^3$/hectare.

**The Ministry of Agriculture and Forestry of Finland's proposal:**

The minimum amount of deadwood (standing and lying) ($m^3$/ha) is:

| Variables | Forest vegetation zone | | | |
|---|---|---|---|---|
| | Southern and hemiboreal | Middle boreal | Northern boreal, south (4a–4b) | Forest and Fell Lapland (4c–4d) |
| **Deadwood ($m^3$/ha), coniferous and deciduous** | 50 | 40 | 30 | 20 |
| **Deadwood ($m^3$/ha), pine dominant** | 40 | 30 | 20 | 10 |

In addition to exceeding the limit value for the volume of decaying wood, deadwood continuity is always required. Deadwood must have formed over a long period of time, and the forest stand must have robust dead trees of all decay stages. Fresh windthrows or windthrows of the same age alone do not make a forest an old-growth forest if there is no deadwood continuity.

**Forests under active management**

The definition does not exclude forests with subtle signs of previous human activity but excludes forest stands where active forestry is practised…[including amongst others]:

Intensive forest management practices include [in addition to other aspects]… drainage, soil cultivation, fertilisation and controlled burning. There may be administrative evidence of active forestry use, such as a notification of forest use or a forest improvement plan.

**Reflection on the above proposed criteria, and comparison with previous criteria for old-growth forests in Finland**

All the government-proposed thresholds shown above are too high to be considered scientifically robust, exceeding previous Finnish criteria on old-growth forests (see also the main body of the report). Trees in boreal primary and old-growth forests are slow-growing and they can be very old but remain rather small and at lesser density and volume than other forest types, and therefore natural levels of deadwood are also low compared to more southerly forest types - which has not been adequately taken into account (Picture 1 illustrates this general principle). The volume of living trees can be, for example, around 330 $m^3$/Ha in spruce dominated forest[R66], and 120-140 $m^3$/Ha in pine dominated forests[R67]. Instead of old-growth forest being of a certain age, the added value for biodiversity comes from individual trees of old age.

The national mapping guideline for Annex 1 habitat type Western Taiga describes the threshold for standing and lying deadwood as minimum 10 percent of the total volume of wood at a site or 10 $m^3$/Ha that is clearly less compared to what the government has proposed. The total volume of deadwood on managed forest in Southern Finland is 5,5 $m^3$/Ha and Northern Finland 8,5 $m^3$/Ha[R68], thus it is appropriate that old-growth thresholds of deadwood should be ≥10 $m^3$/Ha.

The Ministry of Agriculture and Forestry's criteria on deadwood are far higher, for many forest types, than the criteria suggested by the ministry with competence on ecological matters (the Ministry of Environment). In Finland, the METSO conservation program has been functioning for more than ten years (albeit with insufficient budget), to assist the identification of high conservation value forests and their voluntary protection. The METSO threshold for deadwood is 10 $m^3$/Ha in different decay stages.

Earlier in this report we provide analogous Swedish examples of how Scandinavian forest of high conservation value can vary considerably in its deadwood volumes, a range from none to 163 $m^3$/Ha[R43]. Setting must-have thresholds of 30-50 $m^3$/Ha, could exclude significant areas of forests with considerable continuity, natural structure and dynamics, and the potential to host red-listed and threatened species associated with old-growth.

The Ministry of Agriculture and Forestry's criteria on tree age are too high because they suppose not "the presence of old or large trees" (as per the EU guidelines), but instead, high average age which could lead to areas being disqualified that have considerable numbers of veteran trees, simply because natural disturbances have replaced part of the stand with younger generations which bring down the overall average. The EU guidelines are clear (p.8) that natural disturbances are permissible dynamics in forests to be classified as old-growth.

Both METSO and Western Taiga criteria mention a particular number of ages for different tree species but also define other valuable criteria for old-growth forests, such as complexity in the tree structure, habitat trees and indicator species. Ecosystems are varied - there needs to be the potential for some give-and-take across the pertinent indicators of old-growth, rather than "must have" thresholds across indicators which combine to exclude the majority of relevant forests.

The Finland FSC-standard defines criteria for forests with plenty of deadwood: depending on the forest habitat type the minimum volume for deadwood is 10-20 $m^3$/ha. The FSC-standard describes the age of trees at maturity but provides no particular number for the age of the trees.

The proposed criteria on defining actively managed forests are ambiguous and could lead to areas with excellent old-growth characteristics being excluded. For example, much of Finland's forest has experienced drainage, but this does preclude development of old-growth features, and nor does fertilisation; prescribed burning can mimic the natural disturbance many red-listed species depend on[R69,70], so should not be used per-se to disqualify areas.

A clearer articulation of forest management that disqualifies an area, would emphasise forests that do not meet the other criteria for old-growth due to regular ongoing management (e.g. young trees, regularly spaced due to planting or thinning, heavy extraction of wood and deadwood), and should not exclude areas such as long-untouched forests[R71,72] (even once-planted ones) that have recovered qualifying attributes of old-growth.

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Red listed Lung lichen on tree in old-growth forest. © Ola Jennersten