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Criteria for old-growth forests in Finland

Introduction

The EU Biodiversity Strategy 2020 “Bringing nature back into our lives” states that all remaining primary forests and old-growth forests must be strictly protected in EU Member States. On 21 March 2023, the Commission published the “Commission Guidelines for Defining, Mapping, Monitoring and Strictly Protecting EU Primary and Old-Growth Forests” (EU Commission 2023). Member States must use the guidelines for the definition, mapping and strict conservation of the sites. The definitions were to be made in the Member States in accordance with the guidelines by the end of 2023.

According to the Commission’s guidelines, the national methods to be used to identify old-growth forests must be based on the list of indicators included in the guidelines and be consistent with the common definition. In addition, the national methods must be science-based, transparently developed and publicly shared, and harmonised between the Member States for each ecoregion.

According to Prime Minister Petteri Orpo’s government programme “A strong and committed Finland”, the government is committed to protecting the state’s remaining primary, old-growth forests that fulfil the criteria. The government will ensure that the independent criteria are drawn up within a short time frame.

The Ministry of the Environment financed a project for the science-based definition of national criteria that was jointly implemented by the Finnish Environment Institute (Syke) and the Natural Resources Institute Finland (Luke) titled “Primary forests and old-growth forests in Finland: European Commission guidelines and national definitions”. The project’s final report was published on 9 February 2024. The report examined, primarily based on Nordic scientific research, the age of primary forests and the amount and proportion of dead trees compared to that of live trees in different forest types (forest site fertility classes) and forest vegetation zones. From the materials of the National Forest Inventory (NFI), the potential surface areas of old-growth forests were calculated by using different age threshold values and dead wood continuity.

The Ministry of the Environment and the Ministry of Agriculture and Forestry of Finland have prepared the attached official proposal on the criteria to be used in Finland. The Commission’s guidelines on science-based national criteria were taken into account in the preparation. In addition to the results of the above-mentioned Syke and Luke joint project, other available material was also examined during the preparation, including the results and criteria of the state-owned forest mapping conducted by the Natural Forest working group and the scientific selection criteria of the METSO Programme to the extent that they are compatible with the guidelines published by the European Commission.

The entries on which no consensus has been reached between the ministries are marked in the text as follows: the Ministry of the Environment’s proposals in yellow and the Ministry of Agriculture and Forestry of Finland’s proposals in green.

Definitions

Primary forests (luonnontilainen metsä in Finnish) and old-growth forests (vanha metsä in Finnish) must meet the following definitions in accordance with the EU Commission's guidelines (link to guidelines)

Primary forests are defined in accordance with the Food and Agriculture Organization of the United Nations' (FAO) definition. A primary forest is defined as "*A naturally regenerated forest of native tree species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.*" FAO's definition includes explanatory notes.

A large proportion of primary forests may also consist of old-growth forest stands. However, primary forests may also contain younger forests in the regeneration phase (e.g. after natural disturbances).

An old-growth forest is defined as follows: *"A forest stand or area consisting of native tree species that have developed, predominantly through natural processes, structures and dynamics normally associated with late-seral developmental phases in primary or undisturbed forests of the same type. Signs of former human activities may be visible, but they are gradually disappearing or too limited to significantly disturb natural processes."*

The definition of an old-growth forest includes explanatory notes:

- The definition includes forest stands that originate not only from natural regeneration, but also from planted or sown native tree species (provided that they meet the rest of the definition).
- The definition includes forest stands where indigenous peoples engage in traditional forest stewardship activities that otherwise meet the definition.
- The definition includes forest stands with visible signs of abiotic damages (e.g. storms, snow, droughts and fires) and biotic damage (e.g. from insects and diseases) that meet the definition.
- The definition does not exclude forests with subtle signs of previous human activity but excludes forest stands where active forestry is practised.

Old-growth forests contain structural features and dynamics such as natural regeneration, gap dynamics, large and diverse dead wood, structural complexity, and the presence of old trees, or trees reaching senescent stage and tree-related microhabitats.

Old-growth forests may also temporarily lose some of their defining features when subject to natural disturbances such as deforestation or other disturbances that lead to forest regeneration.

Criteria

Main criteria

All the main criteria and, at least, two complementary criteria must be met for a forest to qualify as an old-growth forest. In practice, the EU guideline criterion of "tree species belonging to the native species" is always met in Finland, so the examination of the main criteria should focus on the age of the forest and dead wood.

Age of the forest

Old-growth forests are often characterised by a high volume of standing trees relative to earlier development stages for the given forest type and local growing conditions, and by the presence of old or large trees, some of which may reach the maximum age known for the species under the local site conditions.

Since the age limits for pine and spruce observed in the studies are very similar, it is appropriate to combine all predominantly coniferous forests under the same criteria.

The term "old tree" used in the indicator refers to trees from the previous generation, some of which may reach their maximum biological age. In addition to the average age of the dominant tree stand, the forest usually contains trees from the previous generation.

The Ministry of the Environment's proposal:

The average age of the dominant tree stand is at least

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:

The average age of the dominant tree stand is at least

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

Dead wood

Old-growth forests are characterised by a high proportion and diversity of standing and lying dead wood. The amount and type of dead wood can vary greatly between old-growth forests (depending on the forest type, the local environmental conditions, and the area's recent disturbance history).

The Ministry of the Environment's proposal:

The minimum amount of dead wood is:

- Dead standing trees and lying dead wood 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 dead wood (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)
Dead wood (m^3/ha), coniferous and deciduous	50	40	30	20
Dead wood (m^3/ha), pine-dominant	40	30	20	10

In addition to exceeding the limit value for the volume of decaying wood, dead wood continuity is always required. Dead wood 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 dead wood continuity.

The amount of decaying wood may be smaller in poorly productive forest lands that are sparsely wooded (such as rocky pine forests) if there are no clearly visible signs of human activity and the age of the tree stand is at least 20 years older than the values presented in the main criteria.

The Ministry of Agriculture and Forestry of Finland's addition: The assessment of forest age and dead wood must be based on measured data

The following is the Ministry of the Environment's proposal (their position depends on the dead wood amount policies defined in the previous section; the turnover rate principle itself may be OK):

Exchange ratio

Sites that meet the criteria can also include sites where:

A. The amount of decaying wood exceeds 40 m^3 per hectare or 20% of the total tree stand, and the age of the forest stand falls below the values presented in section 1 by no more than 20 years
B. The age of the forest stand exceeds the values presented in section 1 by no more than 20 years, and the amount of decaying wood constitutes at least either 5% of the total tree stand or 10 m^3 per hectare

Complementary criteria

At least two of the following complementary criteria must be met. In Finnish conditions, it is very likely that at least two of the complementary criteria will be met if the main criteria are met. Therefore, the complementary criteria are assessed on a yes/no scale.

1. Forest stand origin

- *Most old-growth forest stands have emerged as a result of natural regeneration. However, some sown or planted forests can meet the definition if given enough time to develop the characteristics of old-growth forests.*

2. Structural complexity

- *Old-growth forests are generally characterised by structural complexity. This can include a multi-layer canopy structure, horizontal structural diversity, and soil microrelief structures such as mounds caused by uprooting.*

3. Habitat trees

- *Old-growth forests are often characterised by the high density and high diversity of tree-related microhabitats. These are defined as a "distinct, well-delineated structure occurring on living or standing dead trees, that constitutes a particular and essential substrate or life site for species or species communities during at least a part of their life cycle to develop, feed, shelter or breed".*

4. Indicator species

- *Old-growth forests often host species of late-seral developmental phases that are specific to a certain forest type. These can include species on the Red List of the International Union for Conservation of Nature (IUCN).*

Limitations

Active forestry operations

Forests under active forestry do not meet the definition of an old-growth forest:

- A forest stand managed by intensive forest management practices is in active forestry use, unless enough time has elapsed since the practices that the changes in the forest landscape caused by previous active forestry use have already largely disappeared or are disappearing.
- For example, forests managed by means of an extended rotation period, continuous-cover silviculture or more natural forest management principles are in active economic use and, therefore, do not meet the definition of an old-growth forest.
- Biodiversity measures taken in connection with forestry activities, including retention trees, artificial addition of decaying wood and unharvested decaying wood, do not result in the site being defined as an old-growth forest conservation site.

The Ministry of Agriculture and Forestry of Finland's proposed addition:

- Intensive forest management practices include, for example, 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.

Minimum surface area

The minimum surface area of old-growth forest sites depends on how the site can maintain its characteristics in the surrounding forest landscape, for example, on private land: Southern Finland 4 ha and Northern Finland 8 ha, unless the site has a naturally small area, such as a patch of forest on a bog or an inland island. On state-owned land, sites of less than 10 hectares that meet the criteria for an old-growth forest can also be protected as part of the landscape ecological network, unless they are directly adjacent to existing nature conservation areas or if, for some other reason, it is more appropriate to protect them as nature conservation areas.

Inventorying and conservation implementation

State-owned land

- Metsähallitus Forestry Ltd inventories the sites
- The inventory progress is reported regularly and the sites that meet the criteria are published as the work progresses.
- Sites that are likely to meet the criteria are excluded from the operation.
- The inventorying process and the resulting conservation measures are carried out by Metsähallitus under the guidance of the Ministry of Agriculture and Forestry of Finland.
- Potential sites found on state-owned land in the mappings of the Natural Forest and Sápmi working groups are reviewed in the inventories to the extent that information on the mappings is available. Sites that meet the criteria will be conserved.
- Sites that do not meet the criteria for old-growth forests but meet the criteria for natural sites in accordance with the Environmental Guidelines published by Metsähallitus will be treated as valuable habitats or designated as nature conservation areas, depending on the location and characteristics of the sites.

The Ministry of the Environment's proposed addition:

- The conservation of sites on state-owned land will be implemented in cooperation with Parks and Wildlife Finland (public administration services at Metsähallitus) on the basis of ecological entities that are more extensive than strict site boundaries, taking into account the significance of the boundaries for the connectivity of the conservation area network. Buffer zones will be left around small sites in particular.

Private land

- The implementation takes place voluntarily by means of the METSO Programme, meaning that the boundaries are agreed upon with the land owner.
- The implementation will progress within the framework of the land owners' initiatives and available resources
- It is not possible to carry out a comprehensive advance inventory of qualifying sites on private land

The Ministry of Agriculture and Forestry of Finland's note: The mapping of private land is clearly recorded and scheduled in the EU guidelines, the preparation of which the Ministry of Agriculture and Forestry of Finland and the Ministry of the Environment participated in. It would be important to have a clear written decision on political waiver.

Impact assessment

Assessment of the conserved surface area and its allocation

The effects of the decision to conserve old-growth and primary forests depend on:

- how many sites that meet the criteria are ultimately found on state-owned and private land in the inventory,
- how the sites are distributed geographically,
- how much larger, ecologically appropriate boundaries would increase the conserved area on state-owned land, and
- how willing private forest owners are to conserve their qualifying sites.

In order to assess the impact on the state and limit the state's commitment, the Finnish Government decides that the total surface area of conserved forest and poorly productive forest land on state-owned land will be 100,000 hectares on the southern side of Northern Lapland. When determining this surface area, the estimates of the number of sites meeting the criteria in the report by Syke and Luke were taken into account, as well as the estimate of how much the surface areas will increase with the purposeful expansion of the boundaries. In addition, the number takes into account that inventories are likely to include sites that do not meet the criteria for old-growth and primary forests but which are valuable in terms of their biodiversity and should be excluded from forestry use in accordance with the current environmental guidelines of Metsähallitus Metsätalous Oy. In addition, the sites in Northern Lapland that meet the criteria will be conserved.

In terms of private forests, the sites to be conserved are included in the implementation of the METSO Programme, and this decision will not have any new effects outside the effects of the regional expansion of the METSO Programme. The impacts and costs of the continuation of the METSO Programme for the period 2026–2030 have been assessed in conjunction with the impacts of the Helmi Habitats Programme. The METSO Programme will be implemented within the scope of the budget appropriation.

Based on the report by Syke and Luke, it can be estimated that the majority of the sites that meet the criteria will be located in Northern Finland.

To be completed later.