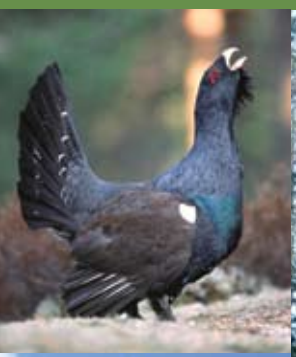
Living Forests



Standard for sustainable forest management in Norway

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Living Forests

Living Forests as a concept was established in 1998, when standards for sustainable forest management in Norway were agreed on. This was a historic event. Stakeholders in forest management and the forest industry, environmental and outdoor recreation organisations, trade unions and consumer interests then reached a consensus for the first time in Norway on standards for sustainable forest management.

Revision of Living Forests

The work to revise Living Forests was carried out in the period from 27 August 2003 to 20 October 2006 by representatives of the following organisations:

The Norwegian United Federation of Trade Unions
The Norwegian National Association for Outdoor Recreation
The Association of Intermunicipal Outdoor Recreation Boards
The Norwegian Forest Owners' Federation
The Norwegian Forestry Association (NORSKOG)
The Norwegian Biodiversity Network (SABIMA)
The State-owned Land and Forest Company (Statskog SF)
The Norwegian Pulp and Paper Association
The Norwegian Sawmill Industries' Association
WWF Norway

The chair of the working group was Stein Lier-Hansen, managing director of the Norwegian Federation of Industries.

All text in this document is part of the consensus on the revision of Living Forests. In connection with the revision it was agreed to change the Living Forests Standards to the Living Forests Standard, whereby the revised and new individual standards are changed to requirement sections.

Living Forests Council

Living Forests has a permanent council called the "Living Forests Council".

The Living Forests Council shall help to foster communication and trust among the parties during the period between revisions and serve as a formal forum for clarifying possible disagreements on the interpretation of the consensus.

In addition, the Council shall monitor the objectives connected with the individual sections and implement measures if necessary.

National standard

Living Forests is a national standard for sustainable forest management in Norway.

Living Forests' objective is forest management that:

- Complies with all relevant national laws and regulations.
- Preserves the environmental quality of old-growth natural forest.
- Conserves the diversity of forest ecosystems.
- Preserves the basis for viable populations of species indigenous to Norway.
- Provides a basis for the active utilisation of forest resources for profitable commercial activities and economic growth.
- Creates a green reputation for Norwegian forest-based products in the international market.
- Ensures that those who work in forests have a working environment in which their health and safety are protected.
- Ensures that Norwegian forests provide the basis for varied outdoor recreation where nature can be experienced in all its richness.
- Helps to preserve cultural monuments sites and valuable cultivated landscapes.

(This list is not exhaustive)

Requirement sections

The Living Forests Standard for sustainable forest management in Norway has 25 requirement sections, each holding specific requirements that together cover areas and actions that have an environmental impact on or are of importance for forest management.

Each requirement section is introduced with a brief description of what the section seeks to achieve. Furthermore the section contains a description of:

REQUIREMENTS AND RULES

Requirements and rules describe what the forest owner must do to achieve the goals set for Living Forests. Requirements may be a clarification of statutory obligations on the managers of forest holdings in general. They may be requirements for planning or documentation at the holding level and specific requirements to be followed for harvesting and forest management. Rules are descriptions and specifications of how the requirement is to be implemented in harvesting and forest management.

MONITORING

Monitoring is a description of requirements for forest conditions in areas greater than an individual holding. Here the Living Forests Council can take action if set minimum requirements are not met.

EXPLANATIONS

For each requirement section there are explanations of terms or definitions used in requirements and rules.

Environmental certification of forest management

The Living Forests Standard may be used in the environmental certification of forest management regardless of certification system. The requirement sections are obligations forest owners must fulfil when managing their forest holdings, whether they are directly certified or part of a group certification. The requirements apply at the holding level unless otherwise specified.

Relationship to acts of law and regulations

The Living Forests Standard is based on acts of law and regulations that govern commercial activities in forests. Where laws and regulations govern commercial activities in forests, the statutory provisions have precedence over the Living Forests Standard.

Redirected use of forest areas for other than agricultural purposes is governed by Norwegian legislation, including the Planning and Building Act and the Land Act, and is permissible only after the authorities have done a total social impact assessment and issued the necessary permits.

High Conservation Value Forest

In international forest certification the term High Conservation Value Forest, abbreviated HCVF, is used for forests with high conservation value. Such forests are defined internationally in four groups:

1. Forests of global, regional or national significance and conservation value because they contain:
a. Concentrations of biodiversity values (e.g. endemism, endangered species, refugia) and/or
b. Large landscape level forests where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.

2. Forest areas that are or contain rare, threatened or endangered ecosystems.

3. Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control).

4. Forest areas fundamental to meeting basic needs of local communities and/or critical to local communities' traditional cultural identity.

For Norway, HCVF areas may be covered by:

- Areas of ecological importance set aside in accordance with Living Forests.
- National parks and nature reserves.
- Protection forest set aside as protection against natural damage pursuant to Section 12 of the Forestry Act.
- Forest areas zoned for the purposes of nature protection or outdoor recreation pursuant to the Planning and Building Act.
- Areas preserved administratively.

Requirement sections of the Standard

1. Workforce and qualifications

This section of the Standard is intended to ensure that whoever engages in forestry activities has sufficient knowledge to perform this work satisfactorily in accordance with this Standard.

REQUIREMENTS AND RULES

The forest owner shall see to it that the person performing forestry work on his property receives relevant information about the known environmental value of the forest. The person performing this work must have adequate knowledge of proper and sustainable forest management.

The forest owner and/or the person performing forestry work for the owner must have the necessary knowledge of working techniques and first aid, including the current set of rules on health, safety and the environment related to forest operations.

The forest owner and/or the forest manager must be able to document that the ordinary concerns of safety and public welfare are addressed both for his own employees and for those of contractors.

A forest owner who works in his own forest must adhere to general safety regulations.

EXPLANATIONS

The forest owner's responsibility for "ensuring that the person performing forestry work on his property receives relevant information about the known environmental value of the forest" is limited to the information that is available in public registers or is of a nature that it would be natural for the individual forest owner to be familiar with it.

The forest owner's responsibility obtains irrespective of his own expertise. If the forest owner does not have adequate skills, he must make arrangements to obtain them.

2. Waste management

This section of the Standard is intended to ensure proper waste management and prevent pollution.

REQUIREMENTS AND RULES

In connection with forestry work the forest owner must endeavour to minimise waste and discharges and ensure that any waste that is generated is handled properly.

All waste such as oil and petrol cans, grease tubes, tyres, discarded parts, steel cable, plastic etc. as well as discarded rest huts must be removed when the work is completed.

All special waste such as oil, batteries etc. must be collected and delivered to officially approved waste receivers.

Best available technology (BAT) must be used when choosing machinery and equipment.

Harvesters and forwarders that operates with large quantities of oil under high pressure must be equipped to limit oil spills to a minimum in the event of a hose rupture.

Any oil leaks from machinery used in forest operations must be plugged as soon as possible. Machinery must be kept clean so that leaks may quickly be detected.

All oil storage and fuel tanks must be secured against leaks and potential sabotage.

Fuel shall not be stored close to sources of drinking water (minimum distance of 50 metres) to avoid contamination.

EXPLANATIONS

BAT (best available technology). This is an international standard for choosing the best available technology, such as machinery and material inputs, whenever commercially feasible.

3. Protection of forest areas

This section of the Standard is intended to ensure that management of forest holdings does not adversely affect the resource base.

REQUIREMENTS AND RULES

Forestry measures that can adversely affect the resource base shall not be implemented, cf. the Forestry Act's provisions on forest protection.

Redirected use of forest for purposes other than agriculture is permissible only after the authorities have granted the necessary permits.

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4. Areas of ecological importance

Forests defined as areas of ecological importance are crucial to a large number of forest-dwelling species. This applies especially to species considered as threatened on the Norwegian Red List. This section of the Standard is intended to protect such forests.

REQUIREMENTS AND RULES

At least 5 % of productive forest areas shall be managed as areas of ecological importance.

This requirement can be complied with in two ways:

1. For certification of an individual holding, the requirement applies at the holding level according to the rules in subsections A and B. Forest owners in an area may collaborate to comply with subsection A of the rules.

2. For group certification, the requirement applies according to the rules in subsections A and C. Forest owners in an area may collaborate to comply with subsection A of the rules. Subsection C describes requirements for the certificate holder. Alternatively, a forest owner or group of forest owners may choose to comply with the requirement in accordance with subsection 1.

A Key habitats shall be inventoried, selected, documented and specified on maps. The methods Miljøregistrering i Skog (MiS) [Environmental Inventory in Forests] or the Siste Sjanse-metoden (SiS) [Last Chance Method] are to be used. Persons qualified in forest biology approved by the certificate holder shall be used for inventorying and selecting key habitats.

Key habitats shall be left untouched or managed in a way that does not deteriorate the conditions for biodiversity or in a way that improves the conditions for biodiversity. Where areas of ecological importance are managed in a way other than being left untouched, silvicultural measures shall be devised in consultation with a person with qualifications in forest biology approved by the certificate holder.

Older forest on non-productive forest land may be considered a key habitat if it is located adjacent to or in a mosaic with productive forest land and has environmental qualities in accordance with approved inventory methods. Where non-productive forest land is included in an area of ecological importance, the area is counted as productive forest land in the holding.

Selected key habitats are to be documented in an environmental documentation. Where silvicultural measures can be carried out, they must be described in the environmental documentation. Holdings with productive area larger than 25 hectares shall document selected key habitats on an ongoing basis and by the end of 2012.

Until key habitats have been inventoried on the holding, the precautionary principle is to be applied, and the values inherent in likely key habitats shall be preserved until inventorying has been done by professionally qualified personnel approved by the certificate holder.

Ⓑ To the extent necessary to meet the area requirement, in addition to areas in accordance with subsection A, the forest owner shall set aside other forest areas as areas of ecological importance. This requirement applies to holdings with productive area larger than 25 hectares. Such set-asides must be documented in an environmental documentation by the end of 2009.

The forest owner must emphasise setting aside forest areas that eventually can become key habitats (restoration). The forest owner may choose from among areas of the following forest types (see also explanations):

- Mature forests / natural old-growth forests
- Calcareous forests, also younger calcareous forests that are managed according to a plan to protect species diversity
- Swamp forests / bog forests
- Broadleaved temperate forests
- Pasture woodland
- Coastal spruce forests / coastal pine forests
- Forests affected by fire
- Buffer zones with intact ecological function
- Non-productive forest land within or adjacent to areas of ecological importance

Older forest on non-productive forest land may be considered an area of ecological importance when it is adjacent to or in a mosaic with productive forest of the aforementioned qualities. Non-productive forest land may constitute a maximum of 25 % of the area. Where non-productive forest land is included in an area of ecological importance, the area is counted as productive forest land in the holding.

The areas set aside shall remain untouched or be managed in a manner that does not adversely affect conditions for biodiversity.

If the forest owner wishes to exchange set-aside areas with new areas, this must be documented in the environmental documentation and approved by the certificate holder.
Where several forest owners collaborate to meet the requirement, this may be documented in a joint environmental documentation.

Productive forest protected as a Nature reserve or National park pursuant to the Nature Conservation Act may be included in the area. Irrespective of the occurrence in an area of forest protected as Nature reserves or National parks pursuant to the Nature Conservation Act, a key habitat inventory must be carried out in accordance with subsection A.

C. For group certification it must be documented with the aid of statistics by county that at least 5 % of productive forest land is managed as areas of ecological importance.

The following area categories constitute the basis for documenting that at least 5 % of productive area is managed as areas of ecological importance:

1. Areas managed according to the rules in subsection A.

2. Productive forest protected as a Nature reserve or National park pursuant to the Nature Conservation Act.

3. Area categories demarcated according to descriptions in Table a below documented with data at county level from the National Forest Inventory. Up to 25 % forested non-productive forest land may be considered part of the area categories.

The status is described in Table b below.

Table a. Description of area categories

Area category	**Demarcation**
Broadleaved temperate forest	Areas with slopes steeper than 50 %, plus area with slopes steeper than 33 % and skidding distance longer than 500 metres.
Swamp forest	Areas with skidding distance longer than 1000 metres.
Bog forest	All areas except birch-dominated bog forests with site productivity class lower than H11.
Calcareous low-herb forest	Areas in development classes 4 and 5.
Buffer zones	Areas in development class 3 and older with buffer zones wider than 10 metres on average to lakes, rivers or streams and bogs.
Mature forests	Areas in development classes 4 and 5 with skidding distance longer than 2500 metres. Areas in development classes 4 and 5 in slopes steeper than 50 % and skidding distance longer than 1000 metres. Areas in development class 5 with skidding distance longer than 1000 metres of site quality class H6.

Table b. Status in 2006 for area categories at county level in percentage of productive forest.
In counties with more than 25 % forested non-productive forest land in the area categories, the area is reduced to having a maximum of 25 % forested non-productive forest land.

County	Productive forest area with a maximum of 25 % forested non-productive forest land.
Østfold	6.1 %
Oslo and Akershus	6.1 %
Hedmark	11.7 %
Oppland	10.2 %
Buskerud	9.3 %
Vestfold	7.7 %
Telemark	13.3 %
Aust-Agder	16.6 %
Vest-Agder	14.1 %
Rogaland	16.4 %
Hordaland	16.3 %
Sogn og Fjordane	21.5 %
Møre og Romsdal	16.6 %
Sør-Trøndelag	21.0 %
Nord-Trøndelag	23.2 %
Nordland	21.7 %
Troms	21.0 %

Statistics of areas managed according to subsection C within each county are approved by the Living Forests Council.

Requirements for measures connected with harvesting in area categories subsection 3

When harvesting within area categories under subsection 3, a certificate holder in counties with forest area less than 9 % (total forest area from subsections 1, 2 and 3 above) must ensure that the holding in question manages at least 5 % of the productive forest as areas of ecological importance. Prior to harvesting, an inventory of environmental qualities must always be done of assisted by Living Forests' routine for precautionary assessments of possible key habitat. The inventory shall be approved by the certificate holder.

In counties where the total area constituting the basis for documentation falls below 7 %, it must for the holding in question be documented and specified on maps that at least 5 % of productive forest is managed as areas of ecological importance, cf. subsection B.

In counties where the total area constituting the basis for documentation falls to below 5 %, it must be documented and specified on maps that at least 5 % of productive forest is managed as areas of ecological importance, cf. subsection B. The Living Forests Council shall approve the implementation.

Each year all certificate holders must report harvesting activities in forest categories according to subsection 3.

EXPLANATIONS

Key habitats
Key habitat is a term for areas inventoried, selected and managed as part of area set aside as areas of ecological importance in accordance with Miljøregistrering i Skog [Environmental Inventory in Forests] (see separate instructions prepared by NIJOS 2001 and the main report from the Environmental Inventory in Forests project) and the Siste Sjanse-metode [Last Chance Method] (see Siste Sjanse report 2002-11).

Mature forests / natural old-growth forests
Mature forests are development classes 4 and 5. Forests to be set aside as areas of ecological importance are to have qualities that will enable the forest land to become a key habitat (restoration). Such forests are usually characterised by a varied age structure and storeying.

Natural old-growth forests have a dynamic that is considered to be dominated by natural disturbances and that evinces little in the way of human impacts. This is reflected in the composition, variation and structure of the forest.

Calcareous forests, also younger calcareous forests that are managed according to a plan to protect species diversity

Calcareous forests or calcareous low-herb forest is a special vegetation type. Where restoration has been initiated in younger forests to protect species diversity, the forest may be counted as an area of ecological importance.

Swamp forests / bog forests
Bog and swamp forests mean forests on peat land or swampy soil where the vegetation is dominated by hydrophilic species and element of bog plants. Bog forests are primarily the vegetation type wooded ombrotrophic bog. Swamp forests are primarily the vegetation types poor swamp forest and rich swamp forest. Bog

and swamp forests often act in a mosaic with bogs and/ or solid ground as gradual transitions. Bog and swamp forests can be divided into productive forest, with production capacity greater than 1 m^3 per hectare per year, and non-productive forest areas with a minimum tree density of 60 trees per hectare that are at least five meters high.

Broadleaved temperate forests
Broadleaved temperate forests are forests dominated by temperate broadleaved species such as elm, ash, beech, oak, lime, Norway maple and black alder.

Pasture woodland
Older woodland in a cultivated landscape that may be assigned to development classes 4 and 5 (with a minimum tree density of 60 trees per hectare) may be counted as an area of ecological importance.

Coastal spruce forests / coastal pine forests
Coastal spruce forests are found in ravines and in humid areas along the coast in Trøndelag and in Helgeland. Also characterised by lichens and mosses in the "Trøndelag element". Several of the species are considered as threatened on the Norwegian Red List.

Coastal pine forests in various subtypes that are rare in Norway and internationally. Their main distribution is from Rogaland to Møre og Romsdal. Important subtypes are the bell heather-pine forest, low-herb-pine forest with ivy and holly, pine-hazel forest with well-developed lichen flora and so-called "mineral-rich pine forest" in Møre og Romsdal.

Forests affected by fire
Burnt forests in development classes 3, 4 and 5 may be counted as long as there is an element of standing dead trees.

Buffer zones with intact ecological function
Forests in buffer zones in development classes 4 and 5 with a minimum average width in accordance with the rules in the sections buffer zones and intact ecological function are counted as areas of ecological importance.

Non-productive forest land within or adjacent to areas of ecological importance
Non-productive forest land means older forest with production of less than 1 m^3 per hectare per year, with a minimum of 60 trees per hectare that are at least five metres high. Non-productive forest land may be solid ground or bog and swamp forests. The most relevant examples are calcareous forests, landslide zones with broadleaved temperate forest, bog forests and swamp forests.

5. Forests affected by fire

This section of the Standard is intended to ensure conditions for life for species more or less dependent on burnt forests as a natural environment.

REQUIREMENTS AND RULES

When forest fires occur in older forests where more than 0.5 hectares are affected by fire, 0.5 hectares per holding are to be left untouched for ten years. When forest fires occur in older forests in areas of less than 0.5 hectares, the entire area is to be left untouched for ten years.

During the ten-year set-aside period, set-aside burnt forest is to be evaluated according to the standard "Areas of ecological importance".

Following forest fires greater than 10 hectares, the setting aside of forest is to be evaluated by professionals qualified in forest biology and be justified professionally.

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6. Mountain forests

This section of the Standard is intended to ensure biodiversity and the recreational values of mountain forests.

REQUIREMENTS AND RULES

In protection forests bordering mountain areas efforts shall be made to promote and maintain a mature forest character.

The harvesting methods for spruce must as far as possible follow the "mountain forest selection cutting system". Small-scale clear-cutting and smaller seed tree stand felling should be used as far as possible to promote regeneration in the pine forest.

Mountain forest harvesting requires that the forest after harvesting can still be classified as either development class 4 or 5.

MONITORING

At least 50 % of the forest in the protection forests bordering mountain areas are to have a mature forest character. This is to be assessed on the basis of the data available at any given time from the National Forest Inventory for each county. The Council is obliged to take action when data from the National Forest Inventory show a trend threatening the objective of at least a 50 % share of mature forest character. Here the share of forest with a mature character is measured as forest in development classes 4 and 5.

EXPLANATIONS

Mountain forest means protection forests bordering mountain areas defined in accordance with Section 12 of the Forestry Act. Rules laid down pursuant to the Forestry Act shall be complied with.

Small-scale clear-cutting is clear cutting of areas from 0.2 to 0.5 hectares, dimensioned so that they can be regenerated naturally from the edges.

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7. Outdoor recreation

Experiencing nature is an essential part of outdoor recreation. This section of the Standard is intended to contribute to ensure opportunities for access to and appreciation of nature in forest.

REQUIREMENTS AND RULES

Forest management activities must consider maintaining the quality of outdoor experiences, especially along hiking and skiing trails.

The public has the right of unimpeded access to the forests, as well as to pick berries and mushrooms within the constraints set by the Open-air Recreation Act and other legislation.

All commercial activity in forest areas must be conducted in such a way that the de facto content of the right of unimpeded access is maintained.

Within the framework of reasonable commercial exploitation and privacy, the forest owner must contribute to appropriate solutions for constructing hiking and ski trails, rest areas etc. and for outdoor areas for nurseries, schools and before- and

after-school programmes, and grant permission for such when they do not conflict with important commercial or ecological considerations. This does not alter the rights pursuant to the Open-air Recreation Act.

The section “Buffer zones” is no impediment to the establishment of fishing spots, rest areas and overlooks where they do not conflict with important commercial or ecological considerations.

EXPLANATIONS

Hiking and ski trails mean all hiking and ski trails that are marked in the field, that appear on the N50 map series or have an equivalent use or appear clearly in the landscape. t

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8. Old, large trees and dead wood

This section of the Standard is intended to ensure habitats for species dependent on old, large trees and dead wood.

REQUIREMENTS AND RULES

In harvesting, an average of ten wind-resistant trees per hectare must be left standing as retention trees, preferably in clusters. Retention trees should be selected among the oldest trees in the stand.

Standing dead deciduous trees, large dead pines and natural high stumps of all tree species shall normally be spared in harvesting.

Dead wood lying on the ground older than five years shall not be removed in harvesting.

Both dominant species and any rare/unusual species must be among the retention trees.

Trees with great visual value, trees with a bird nest function, old large aspen trees and old pollarded trees are to be given priority for selection as retention trees.

Where there is a risk of windthrow, spruce and aspen trees can be cut to high stumps, but not all the trees of the same species. Artifical high stumps may be included among the count of retention trees.

Retention trees that die must remain standing. Retention trees that have blown down may be removed out of consideration for hikers or skiers and where they are considered dangerous to children at play.

Standing dead spruces may constitute up to half of the number of retention trees. Standing dead trees and high stumps considered dangerous to children at play may be felled.

There is no requirement to have the same species composition among retention trees as in the harvested area, but the principal species must be represented.

Leaving spruces standing as retention trees may be advantageous in:

- buffer zones along rivers or streams, bogs or arable lands that are part of the area of forestry operations. Where retention trees are located in buffer zones, it is not necessary to increase the width of the buffer zone. Such a placement of retention trees improves ecological functioning

- places that for reasons of topography are more sheltered against wind, such as in depressions, in small canyons and against rock faces

- boundaries with neighbouring stands or in other stands in the operating area

The requirement for ten retention trees per hectare applies as an average for a defined operating area, which may consist of several stands.

Retention trees belonging to harvests already carried out must be identifiable, also when the retention trees are located outside of the operating area where it is a part of an operating area that is being harvested over several years.

To find wind-resistant spruces that can function as retention trees, suppressed trees with a diameter down to approx. 20 cm may be used.

If site quality conditions vary in the operating area, priority should be to have retention trees of different site quality classes.

Alien species must not be left standing as retention trees. The same applies to spruce in afforestation areas in afforestation districts and foreign provenance that is obviously not adapted to conditions on the growing site.

EXPLANATIONS

Trees with a bird nest function are trees with woodpecker holes or nests of birds of prey.

A natural high stump means a tree dead from natural causes, the upper part of which has fallen off. An artificial high stump means a tree with its top cut off taller than approx. 3 metres.

Relationship to forest hygiene

Retention trees that die must remain in the stand. Only in very few exceptions this will be in conflict with the provisions of the Regulations concerning sustainable forest management. For the requirements of the Standard to be set aside, a written order must be issued by the forest management authorities to remove such trees.

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9. Protection of genetic material – forest trees

This section of the Standard is intended to ensure natural genetic variation in forest trees.

REQUIREMENTS AND RULES

The natural genetic variation of forest trees must be protected. Genetically modified plant material shall not be used. The rules for the use of seeds and plants in the Regulations concerning tree seeds and plants must be built upon.

The documentation of the origin of seed and plant material used must be retained.

10. Fertilising and nutrient balance

This section of the Standard is intended to ensure that fertilising and ash spreading take place in a proper manner and that nutrient loss and nutrient leakage shall be kept at a minimum.

REQUIREMENTS AND RULES

Forests management activities shall maintain the natural processes and long-term productivity of the soil. Nutrient loss and nutrient leakage should be kept at a minimum. Areas of special environmental value shall not be fertilised or impacted by fertilising or ash spreading.

To increase forest production, fertiliser may be applied to suitable areas with vegetation types such as heather-bog bilberry-pine forest, cowberry-bilberry forest and bilberry forest. Peat land may be fertilised where regeneration already is established. Vitality fertilising may be performed when it has been determined that the forest has diminished vitality due to anthropogenic pollution.

Ash may be spread in forests as a way of restoring nutrients to suitable forest areas. Ash spreading during the breeding season is to be avoided. Only hardened and treated ash with approved values for heavy metals may be returned to the forest. Only granulated ash products may be used in clear-cut areas.

During the fertilising and spreading of ash in forests, zones abutting lakes and rivers or streams should be left unfertilised to prevent runoff. Fertilising shall not take place before the end of the snowmelt; in addition the time for fertilising should be set to minimise the risk of nutrient leakage. Ash spreading may begin when the snowmelt starts.

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11. Harvesting methods

This section of the Standard is intended to ensure harvesting and regeneration methods are used that balance forest owners' economic interests with the interests of biodiversity and other environmental values.

REQUIREMENTS AND RULES

The harvesting potential is to be exploited within the framework set by economic considerations, biodiversity and other environmental values. A higher share of selection cutting is to be arranged for through thinning.

The selection of harvesting methods and the implementation of the harvest shall be adapted to local conditions, to maintain local environmental qualities, take due consideration of the landscape and ensure conditions for the satisfactory regeneration with species suited to the local growing area.

Where economic and biological conditions are suitable, selection cutting shall be applied in connection with spruce regeneration. The use of selection cutting in spruce-dominated forests assumes that adequate stability can be maintained for trees still standing and that the harvesting method allows for satisfactory regeneration under existing local conditions. Small-scale clear-cutting may be applied when this affords satisfactory opportunities for natural regeneration. If conditions do not allow for natural regeneration, clear-cutting methods is to be used, followed by planting or seeding.

Where conditions are suitable, pine forests shall be regenerated through seed tree methods or other forms of harvesting that facilitate natural regeneration. Clear-cutting and planting shall be used when shifting to new species and where conditions are not suitable for natural regeneration.

Selection cutting shall be used in broadleaved temperate forests where suitable to establish adequate regeneration. New species should not be introduced in broadleaved temperate forests, with the exception of bilberry-oak forest.

The size and shape of clear-cut and seed stand felling areas shall be adapted to the lines and formations of the landscape. In actively used recreation areas, emphasis should be on limiting and varying the size of the clear-cuts.

Debris from harvesting shall be cleared from creeks, rivers, lakes and hiking and ski trails once harvesting is completed.

Unless special conditions warrant otherwise, clearing must be undertaken immediately after harvesting is completed. While harvesting is in progress, hiking and ski trails must be cleared as soon as is practically possible to avoid unnecessary obstructions to public access.

EXPLANATIONS

Small-scale clear-cutting is clear cutting of areas from 0.2 to 0.5 hectares, dimensioned so that they can be regenerated naturally from the edges.

Hiking and ski trails mean all hiking and ski trails that are marked, that appear on the N50 map series or have an equivalent use or appear clearly in the landscape.

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12. Buffer zones

This section of the Standard is intended to ensure the protection or development of stable buffer zones along bogs, lakes, rivers or streams and cultural landscapes. Buffer zones have a number of vital ecological functions and serve several purposes related to biodiversity, water quality, the landscape and outdoor recreation.

REQUIREMENTS AND RULES

Where natural conditions exist, multi-storied forest stands shall be maintained or developed in buffer zones adjacent to bogs, lakes and rivers or streams and to cultural landscapes, through forest management and harvesting methods.

Buffer zones to bogs

Buffer zones along bogs must be on solid ground, but trees in the bog may be included when assessing the ecological function of the buffer zone.

An effort shall be made to maintain the indigenous tree species mix within the buffer zone.

The width of the buffer zones
The ecological conditions are indicated by the types of vegetation. It is important to create stable buffer zones. The width shall be adapted to local conditions and may vary within a single buffer zone. Only in exceptional cases will there be a need for buffer zones wider than one tree height. Single rows of trees have hardly any ecological function. Alongside bogs the type of vegetation and the terrain shape are to provide guidance for the width of the buffer zone.

Given a basic buffer zone width of 10-15 m, the following adjustments should be made:

- Broadleaved temperate forests, tall-herb forests, tall-fern forests and swamp forests – substantially wider (25-30 metres).
- Steep terrain alongside bogs - narrower buffer zone.
- Dry vegetation and dry ground alongside bogs - narrower buffer zone.
- One-storied pine forests - narrower buffer zone.
- Dense, storied deciduous forests alongside bogs - narrower buffer zone.
- One-storied spruce forests - very narrow buffer zone.
- Smaller bogs - down to 5 metres.

Establishing buffer zones is normally only relevant for bogs and swamp forests larger than 0.2 hectares.

Silviculture in the buffer zone
Individual trees may be harvested in the buffer zone, though not so many that the buffer zone cannot maintain its function. All indigenous species, storeying and key elements of a buffer zone shall be present also after any harvest of individual trees. Logging may take place in older one-storied forests to establish a multi-storied buffer zone. In one-storied forests in development classes 3 and 4 it should be emphasised through thinning to establish an adequate buffer zone with deciduous forests prior to final harvesting. Buffer zones should be established and developed as naturally as possible.

EXPLANATIONS

By a buffer zone's ecological functions it is meant:

- Creating stable corridors with older forests in the landscape.
- Being a habitat for species requiring a stable environment.
- Being a functional environment with an element of old trees and dead wood.

Buffer zones to bog or swamp forests are an aesthetic element of the forest landscape.

Bog and swamp forests mean forests on peat land or swampy soil where the vegetation is dominated by hydrophilic species and elements of bog plants.

Buffer zones to lakes and rivers or streams

Multi-storied buffer zones shall be maintained or developed alongside lakes and rivers or streams wider than one metre at normal flow where this is natural.

The width of the buffer zones

Ecological conditions in and along a river or stream are indicated by the types of vegetation. It is important to create stable buffer zones. The width shall be adapted to local conditions and may vary within a single buffer zone. Only in exceptional cases will there be a need for buffer zones wider than one tree height. Along rivers and streams wider than two metres the types of vegetation and the shape of the terrain are to provide guidance for the width of the buffer zone. Given a basic buffer zone width of 10-15 m, the following adjustments should be made:

- Broadleaved temperate forests, tall-herb forests, tall-fern forests and swamp forests – substantially wider (25-30 metres).
- Swamp forest bordering the river or stream - wider buffer zone.
- Steep terrain up along both sides of the river or stream - narrower buffer zone.
- Dry vegetation and dry ground along the river or stream - narrower buffer zone.
- One-storied pine forests - narrower buffer zone.
- Dense, storied deciduous forests along the river or stream - narrower buffer zone.
- One-storied spruce forests - very narrow buffer zone.
- Streams narrower than 2 metres - down to 5 metres.

To capture the specific conditions that arise in periodically flooded areas, areas where floods normally occur are to be included in the buffer zone.

For the purposes of outdoor recreation, the buffer zones may be opened up some places, but only if the ecological values will be preserved in other places along the river or stream.

Silviculture in the buffer zone

Individual trees may be harvested in the buffer zone, though not so many that the buffer zone cannot maintain its function. All indigenous species, storeying and key elements of a buffer zone shall be present also after any harvest of individual trees.

Logging may take place in older one-storied forests to establish a multi-storied buffer zone. In one-storied forests in development classes 3 and 4 it should be emphasised through thinning to establish an adequate buffer zone with deciduous forest prior to final harvesting.

Buffer zones should be established and developed as naturally as possible.

EXPLANATIONS

By a buffer zone's ecological functions it is meant:

- Creating stable corridors between older forests in the landscape.
- Being a habitat for many species.
- Providing stable light, shade and temperature conditions for species living in streams and rivers and at the edge of lakes.
- Providing nutrients to the water in the form of litter and micro-fauna.
- Provide opportunities for concealment for species living in streams and rivers and on the edge of lakes.
- Being able to filter nutrient seepage from harvesting.

Buffer zones to lakes and rivers or streams are an aesthetic element of the forest landscape.

Buffer zone to cultural landscapes

Stable and naturally varied fringes of forest around cultivated landscapes, "field islets" and other small-scale habitats are to be developed or maintained through silviculture or harvesting. An indigenous mix of tree species is to be established in the forest fringe, with a substantial percentage of deciduous trees, and priority shall be given to allow deciduous trees to dominate the entire rotation.

The width of the buffer zone
A buffer zone of 5 - 10 metres is sufficient.

EXPLANATIONS

Inventories have been done of especially valuable cultural landscapes. However, these pertain to only a minority of those that must be regarded as valuable. Forest owners in doubt as to whether the cultural landscape is valuable may consult the county governor, the municipal authority or other experts in the field. However, where developed forest fringes around arable land already exist, they should generally be preserved when harvesting.

13. Cultural monuments and sites and cultural environments

This section of the Standard is to ensure that monuments and sites and smaller traditionally cultivated fields in the forest landscape are preserved.

REQUIREMENTS AND RULES

In addition to taking care of automatically protected monuments and sites, other valuable monuments and sites shall also be taken into account. This includes a prohibition against actively establishing new forests on traditionally cultivated fields smaller than 0.5 hectares in the forest landscape. In exceptional cases, forest may be established where the redirected use is approved by the municipal authority pursuant to Section 9 of the Land Act, assuming that this is not in conflict with the interest of valuable monuments and sites or cultural environments.

It is the forest owner's responsibility to familiarise himself with the cultural monuments and sites in the forest that are registered and take this into account in harvesting and forest management. A good tool for this is to ensure correct marking of known monuments and sites and cultural environments in the forest management plan.

EXPLANATIONS

All monuments and sites from before 1537 and all Sami monuments and sites more than 100 years old are automatically protected.

Cultural monuments and sites mean all traces of human activity in our physical environment, including places associated with historical events, beliefs and traditions. In forests there will be numerous monuments and sites not automatically protected because of age. Also among these there are valuable monuments and sites that shall be taken into consideration.

Cultural environment means areas where a monument or site forms part of a larger entity or context.

14. Landscape plan

This section of the Standard is intended to ensure that forest management protects interests across stand and holding boundaries.

REQUIREMENTS AND RULES

For parcels over 1000 hectares, the planning and managing of forests shall take into account considerations of landscape ecology over and above the individual stand. Important landscape ecology features that cross property lines shall also be considered as far as possible on smaller parcels as well.

For example integrated landscape planning involves attaching importance to:

- Locally adapted forest management
- Consideration of the visual appearance of the local landscape
- Percentage of mature forest
- The need for restoration habitats
- Recreation, hiking trails, ski trails
- Forestry roads
- Game habitats, mating areas for capercaillie (wood grouse)

EXPLANATIONS

Landscape ecology is the interaction among ecological processes and the mosaic in the landscape. A landscape ecological perspective means that different natural environments must be found in the landscape at any given time.

Consideration of the visual appearance of the local landscape means that the form of the logging area and use of open harvesting methods (i.e. clear-cutting and seed tree methods) are to be adapted to the forms of the landscape.

Hiking and ski trails mean all hiking and ski trails that are marked, that appear on the N50 map series or have an equivalent use or appear clearly in the landscape.

Considerations of game habitats means planned management of mating areas for capercaillie (wood grouse), forests adjacent to nesting sites for birds of prey etc.

15. Long-term timber production

This section of the Standard is intended to ensure that new forests are established as quickly as possible given the characteristics of the growing site.

REQUIREMENTS AND RULES

In areas where natural regeneration is planned after harvesting, the harvesting must be done in a way that enables regeneration to be established as quickly as possible. If natural regeneration proves unsuccessful, silvicultural measures must be initiated.

In areas where planting or seeding is planned after harvesting, planting or seeding shall be done as soon as is proper and practicable.

Tending of young-growth stands shall emphasise exploiting the areas' potential for quality production and cultivating a forest that allows for a variety of harvest and regeneration methods.

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16. Soil scarification

This section of the Standard is intended to ensure that soil scarification is carried out in the gentlest manner possible.

REQUIREMENTS AND RULES

Soil scarification may be carried out on vegetation areas where such measures will have a beneficial effect on regeneration and the establishment of new forest. Soil scarification shall be done carefully in a manner giving adequate consideration to areas of ecological importance, hiking trails, streams, erosion risk and cultural monuments and sites.

Primarily, ground surface treatment methods shall be used. On slopes with risk of erosion, continuous rows are not allowed.

17. Bogs and swamp forests

This section of the Standard is intended to ensure that forest management measures protect the ecological functions of bogs, bog forests and swamp forests.

REQUIREMENTS AND RULES

New establishment of drainage ditches in bogs and swamp forests is not permitted.

Drainage maintenance and supplementary ditching are permitted as long as there will be no need for restoring key habitats/areas of ecological importance in this vegetation type on the holding in question.

Provided that considerations of stability and regeneration of present tree species permit, selection cutting shall be used in swamp and bog forests and in the transition zone to solid ground.

Where there is natural support for it, silviculture and logging activities should preserve or develop a multi-storied buffer zone along bogs. (See also the section of the Standard for buffer zones.) An effort must be made to maintain the indigenous tree species mix within the buffer zone.

Forest management shall attach importance to protecting the ecological functions of all bogs and swamp forests, irrespective of size. Brush vegetation is particularly important. However, the establishment of buffer zones and adaptation of cutting method are relevant only for bogs and swamp forests larger than 0.2 hectares.

EXPLANATIONS

Bog and swamp forests mean forests on peat land or swampy soil where the vegetation is dominated by hydrophilic species and an element of bog plants. Bog forests are primarily the vegetation type wooded ombrotrophic bog. Swamp forests are primarily the vegetation types poor swamp forest and rich swamp forest. Bog and swamp forests often appear in a mosaic with bogs and/or solid ground as gradual transitions. Bog and swamp forests can be divided into productive forest, with production capacity greater than 1 m^3 per hectare per year, and non-productive forest land with a tree density down to 60 trees per hectare that can be 5 metres high.

18. Afforestation and introduction of new species

This section of the Standard is intended to ensure that afforestation takes place in an environmentally proper way and that the spread of foreign species is kept in check.

REQUIREMENTS AND RULES

Afforestation and regeneration following harvest are to employ Norwegian species. Where there are problems with establishing regeneration with satisfactory production, foreign species may be used. Foreign species may also be utilised to a lesser extent for production of special qualities.

The dispersal of foreign tree species must be kept under control through forest management.

The framing of afforestation areas shall be adapted to the landscape. The emphasis shall be on creating gradual transitions between spruce forests and the surrounding areas. Where possible, a minimum of 10% deciduous trees shall be guaranteed in afforestation areas on individual holdings.

Afforestation activities shall take into consideration heavily used hiking and ski trails to maintain the recreation value connected with the use of the hiking/ski trail. Planting closer than 2.5 metres from such hiking and ski trails is not permitted.

Also not permitted:

- Introduction of new species on wooded ombrotrophic bogs in western Norway.
- Introduction of new species in swamp forests.
- Introduction of new species in broadleaved temperate forests, except the vegetation type bilberry-oak forest on sites of low and medium quality.
- Afforestation of open heather land.
- Introduction of new species in calcareous pine and birch forests.
- Afforestation or introduction of new species in buffer zones to rivers or streams.

19. Forest structure

This section of the Standard is intended to ensure that at any given time at least 30 % of the forest below the protection forest boundary has a structure beneficial to species living in mature forests and to outdoor recreation.

REQUIREMENTS AND RULES

To address the needs of species living in old forests and of outdoor recreation, at any given time, there must be a minimum of 30 % mature forest below the protection forest boundary with the mountains.

This section does not apply at the holding level.

MONITORING

The Council is obliged to initiate measures when county data from the National Forest Inventory show a trend threatening the target of at least a 30 % share of old-growth forest defined as development classes 4 and 5. Documented areas managed according to the section "Areas of ecological importance" and forest protected pursuant to the Nature Conservation Act are included here.

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20. Forest roads

This section of the Standard is intended to ensure that forest roads are built in a manner yielding an adequate forest management solution, while protecting the environment.

REQUIREMENTS AND RULES

The planning and building of forest roads shall address recreational needs and environmental values, in addition to purely forestry-related and other commercial uses of forest. No roads may be built in areas managed pursuant to the section of the Standard "Areas of ecological importance".

Alignments shall be chosen and road standards planned to minimise encroachments in the terrain. The alignment must fit the landscape as far as possible, and the road must be built without heavy cuts and fills.

During the planning stage of new forest roads, the forest owner shall document that the road location does not encroach on areas with inventoried special environmental values. In larger continuous forest areas with particular environmental and recreational value due to the limited scope of technical encroachments, new forest road construction should be avoided. This also applies to road construction in "Class 3"areas in the permanently protected watercourse zones in municipal land use plans.

In marginal forest areas where alternative uses are of major importance, simple road solutions such as tractor roads and winter season roads should have priority.

21. Herbicide spraying

In general, spraying in forests is to be avoided. This section of the Standard is intended to ensure that spraying herbicides in forests is used only when it is clearly more effective than mechanical methods and at the same time does not conflict with landscape qualities and recreational values.

REQUIREMENTS AND RULES

Spraying shall be subject to strict regulation on the basis of the precautionary principle. The need to spray shall be reduced as much as possible by the use of varied cutting and silvicultural methods. Where this does not produce the desired result, spraying is permissible where it is clearly more effective than mechanical methods in preventing growth of grasses, herbs and deciduous trees from hindering regeneration.

Vegetation that is on average more than 2 metres high shall not be sprayed.

In heavily used recreation areas, emphasis shall be placed on ensuring that the landscape qualities and aesthetic values associated with a varied element of deciduous trees are not substantially reduced by such measures.

EXPLANATIONS

Spraying means the silvicultural application of chemical herbicides.

22. Terrain transport

This section of the Standard is intended to ensure that damage to the terrain is limited and that remediation takes place as quickly as possible.

REQUIREMENTS AND RULES

Damage to terrain by terrain transport that disfigures the landscape and may cause water runoff and erosion should be avoided.

In areas with soils with poor carrying capacity where there is a serious risk of damage to terrain during the summer months, log transport shall preferably take place on frozen or snow-covered ground.

Terrain transport shall primarily not take place in areas set aside as areas of ecological importance.

Hiking and ski trails, as well as roads of cultural-historical interests shall not be used for motorised transport where avoidable. Exempted are hiking and ski trails situated on already existing roads built for log transport and for recreational purposes. Exceptions from the main rule may also be made to avoid building new service roads parallel to paths and trails and alternative transport routes that would have a greater adverse impact on the environment and outdoor recreation.

Wheel tracks that cause water runoff and erosion, transport damage to hiking and ski trails and other significant damage must be repaired as soon as moisture conditions permit once the log transport route is no longer in use.

23. Composition of tree species

This section of the Standard is intended to ensure that the species composition addresses economic as well as environmental requirements.

REQUIREMENTS AND RULES

The composition of species is to be adapted to the characteristics of the site. Where climatic and soil conditions allow, the aim shall be for a considerable percentage of deciduous trees, with deciduous trees in clusters and as single trees, including old, large deciduous trees. Where conditions permit, a mix of spruce and pine is to be aimed for.

At the holding level, 10 % of the total growing stock in development classes 3, 4 and 5 shall be normative for the percentage of deciduous trees.

Norwegian species that are rare in the area are to be protected and/or encouraged through forest management measures.

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24. Openness regarding environmental information

This section of the Standard is intended to ensure openness regarding the grounds for decision-making and the implementation of the Living Forests Standard.

REQUIREMENTS AND RULES

Required environmental information pursuant to the Environmental Information Act regarding data from environmental inventories or other kinds of environmental information associated with the management of forest resources on the holding shall be submitted whenever requested.

MONITORING

For group certifications, a summary of the audit reports that show any environmental non-conformances and observations found shall be publicly available. The audit report is to be prepared by an external auditor.

25. Sami rights

This section of the Standard is intended to ensure that Sami rights are protected wherever forestry activities are engaged in.

REQUIREMENTS AND RULES

The forest owner shall respect Sami rights and take them into account. If there are Sami rights attached to the holding, they shall be protected.

Living Forests

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