METSÄHALLITUS

Metsähallitus Forestry

A pioneer in multiple-use forests



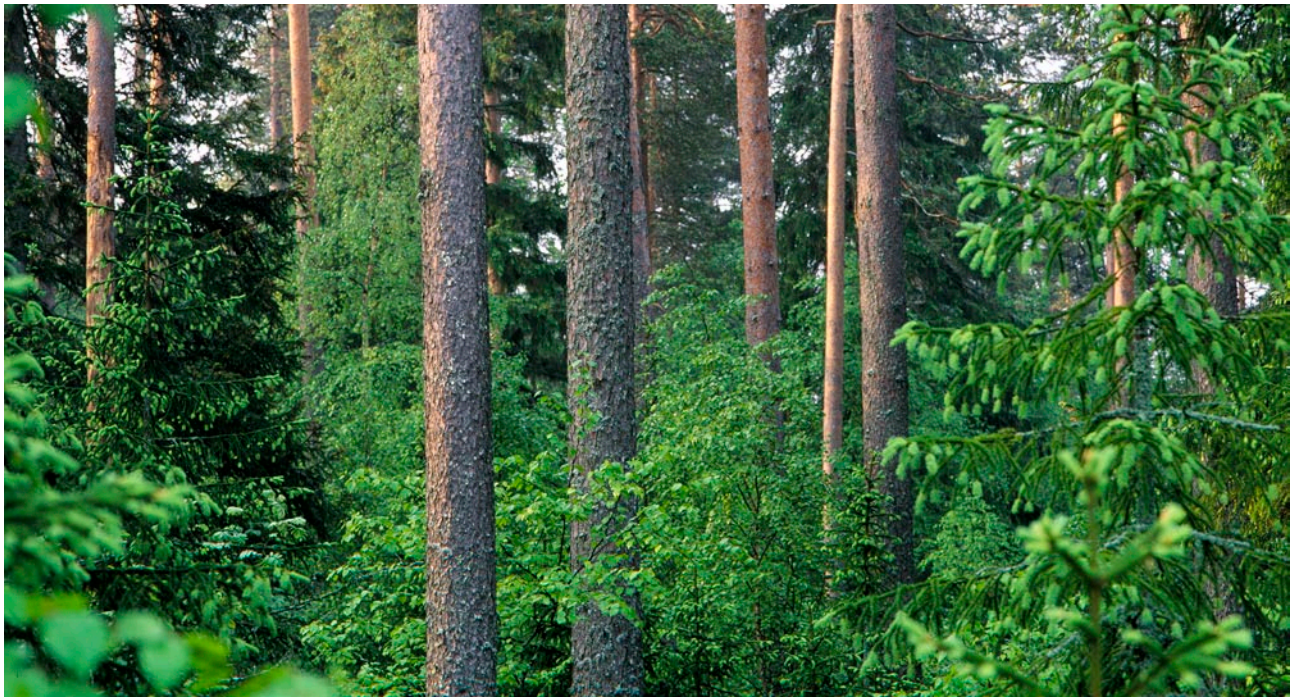
MULTIPLE-USE FORESTS OF METSÄHALLITUS

Forests are Finland's most important natural resource. The wood obtained from them goes through various intermediate stages to be shaped into yoghurt cartons, CD covers, packaging for online purchases, artistic publications, newspapers or wood houses – or to generate heat for our houses.

Metsähallitus manages about a third of Finland's commercial forests. The forests of Metsähallitus are vibrant forests that are used for various things, not just to produce wood, but also for recreation and preserving biodiversity.

Metsähallitus works on the principle of co-operation, openness and interaction with all parties interested in the use of state-owned land. The interactive approach helps minimise conflicts and achieve solutions that are well founded and widely accepted.

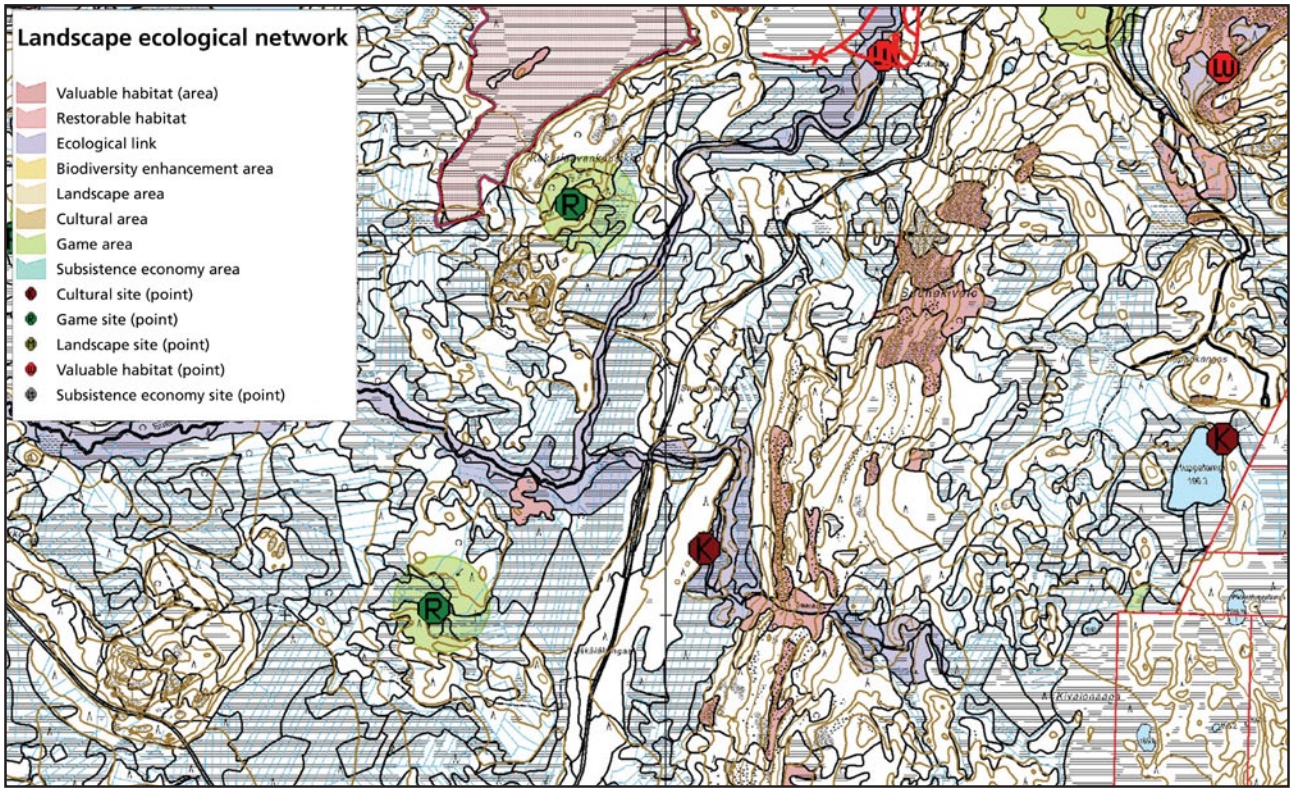
Commercial forests and protected areas act as an ever-increasing carbon sink that mitigates climate change. Photo by Timo Nieminen.



THE ALL-INCLUSIVE GEOGRAPHIC INFORMATION SYSTEM

Metsähallitus operates a geographic information system (GIS) with comprehensive data on state-owned land, including current land uses, site classes, growing stock, recreational routes and facilities, roads as well as various special values, such as occurrences of threatened species, valuable habitats and cultural heritage sites as well as landscape and game sites. Using an up-to-date GIS in various phases of operational planning ensures that these special values are taken into consideration when utilising the forests.

A thematic map of the landscape ecological network includes the special sites found in the area.



PROMOTING FOREST BIODIVERSITY

Biological diversity provides a basis for the supply of a multitude of ecosystem services and an opportunity to utilise the various benefits of nature. Furthermore, biodiversity supports the functioning and restorability of ecosystems, for example the ability to withstand damage and reduce the threat of alien species.

The beetle known as the eyed squeaker (Saperda perforata) *has benefited from aspens left standing in felling areas. In fact, the 2010 Red List of Finnish Species classified it as Least Concern. Photo by Esko Hyvärinen.*

BIODIVERSITY RELIES ON THE ECOLOGICAL NETWORK

Safeguarding and promoting biodiversity is an integral part of forestry at Metsähallitus. The majority of the area in forestry use consists of multiple-use forests which are suited as habitats for most of our forest species.

Multiple-use forests include special sites of the ecological network with the purpose of maintaining valuable habitats characteristic of the area as well as their species, some of which are quite demanding. The sites of the ecological network are excluded from forest management activities, or they are treated carefully considering their special nature.

VALUABLE HABITATS ARE TOTALLY EXCLUDED FROM FOREST OPERATIONS

The core of the ecological network is made up of protected areas, valuable habitats as well as occurrences of certain species.

Valuable habitats include herb-rich forests, stands of broadleaved deciduous species, old-growth forests, heathland forests with plenty of decaying wood, sunlit slopes on sandy esker ridges, wooded heritage biotopes, wooded cliffs and bluffs, fertile mires as well as the surroundings of small water bodies such as springs, brooks, rivulets and small ponds. Some of these valuable habitats are defined in the Forest Act and the Nature Conservation Act.

A brookside forest marked as a valuable habitat. Photo by Esko Hyvärinen.

ECOLOGICAL CORRIDORS AND BUFFER ZONES ENHANCE THE SPREAD OF SPECIES

The core areas excluded from commercial forestry are linked by ecological corridors and stepping stones. Besides these, the ecological network includes various buffer zones such as environmentally valuable forests and biodiversity enhancement areas. Recreational and landscape sites also support the ecological network. The planning and treatment of special sites are tailored processes. The management of forests adjacent to protected areas is planned in co-operation with experts from Metsähallitus Natural Heritage Services.

Metsähallitus has many kinds of special sites established by its own decision. Site-specific planning is a way to safeguard their special environmental values. The ecological value of small protected areas or concentrations of valuable habitats may be enhanced by locating special sites in their vicinity.

RETENTION TREES ARE IMPORTANT FOR SPECIES DEPENDENT ON DECAYING WOOD

Many threatened forest species need decaying wood. Leaving retention trees is a way to secure a sufficient supply of deadwood also in future phases of stand development. Retention trees are also very significant to the landscape.

Ideal retention trees include exceptionally large and prominent individuals as well as cavity trees. Groups of retention trees should preferably consist of large-diameter broadleaves, especially larger aspens and goat willows. Large-diameter pines are also important as potential nest trees for large birds of prey.

Groups of retention trees are placed by ecological and landscape criteria. Regarding species dependent on decaying wood, larger concentrations of retention trees are more effective than single trees or groups of a few trees.

Most of the retention trees left in felling areas are living trees which will eventually turn into deadwood. Naturally dead standing trees are also valuable as retention trees.
Photo by Ari Rautio.

ACTIVE MANAGEMENT OF HABITATS

Metsähallitus promotes biodiversity in multiple-use forests by actively managing important habitats. Habitat management is generally practised on a small scale, and focused on key sites in terms of biodiversity.

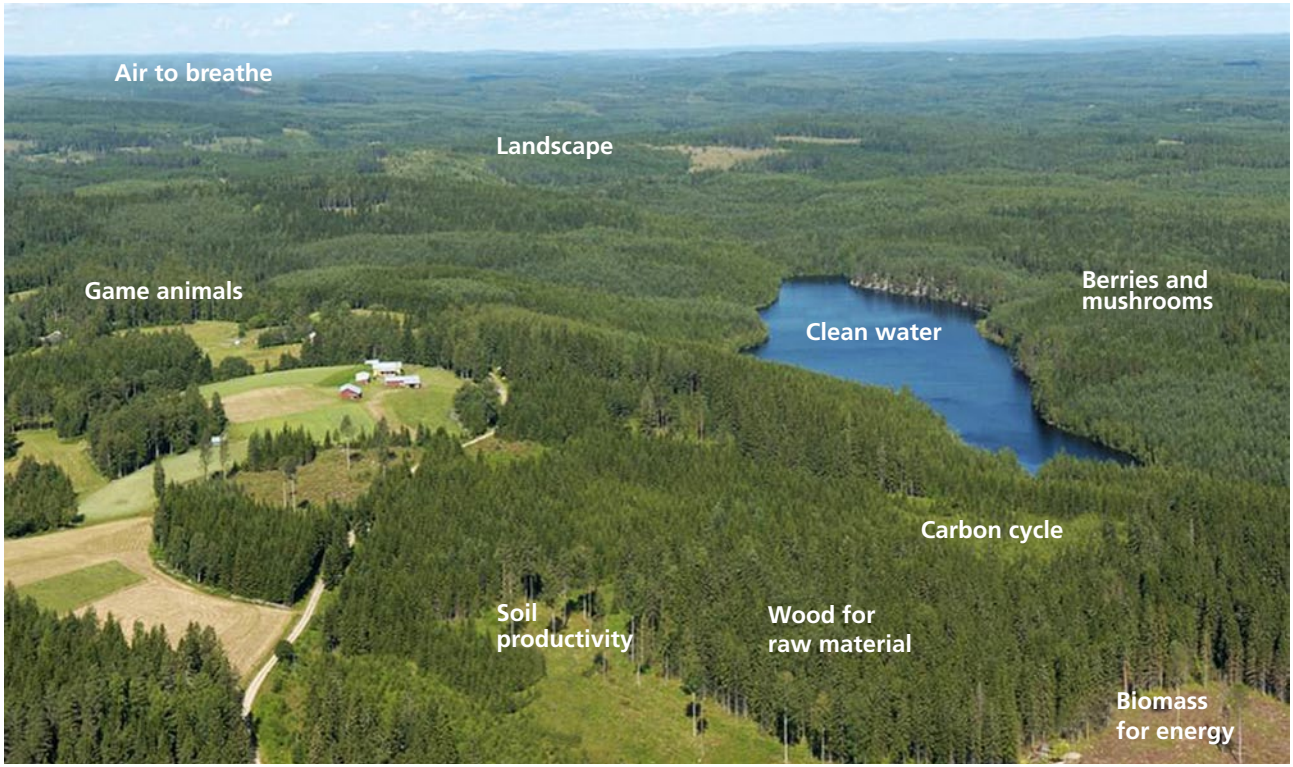
Active habitat management includes prescribed burning, burning of retention tree groups, restoration of mires as well as management of sun-exposed esker habitats and herb-rich forests. Metsähallitus is involved in the restoration of brooks and streams in joint projects with other actors.

As a result of restoration, water has returned to a dried-up brook in a spruce mire. Photo by Timo Eskola.

SECURING FOREST ECOSYSTEM SERVICES

Benefits derived from nature are called ecosystem services. Forest ecosystem services include raw material production as well as less tangible services such as flood control and carbon sequestration. Wood is the single most important renewable raw material in Finland, the basis for our economic prosperity. As a natural process, wood production too relies on other ecosystem services such as nutrient and water cycles. On the other hand, wood production also generates many more ecosystem services, for example carbon sequestration from the atmosphere, hunting opportunities and beautiful landscapes. Not all ecosystem services have a market price.

Forest ecosystem services placed in a Finnish forest landscape. Photo by Lentokuva Vallas Oy.



In the tending of seedling stands, all tree species suited to the site are utilised. Photo by Antti Otsamo.

IDENTIFYING NATURAL SITE FACTORS WILL RESULT IN VIBRANT FORESTS

The management of multiple-use forests is aimed at economically profitable wood production, while securing forest ecosystem services as well as forest health and well-being. At Metsähallitus, wood production is practised on naturally fertile forest land with mineral soils and on peatland drained for forestry.

Silviculture is based on the natural wood production potential of the site and its optimum utilisation. It is important to identify the key site factors in terms of silviculture, and to use them as a basis for making the decisions on silvicultural treatments. Silvicultural work must also be timed correctly in order to keep the growing stock vital. By doing so, it is possible to grow vibrant stands of native tree species which are best suited to each site. Forest management that is based on site factors will yield good economic returns, maintain biodiversity and living conditions for various game animals, create a variety of landscapes and enable multiple uses of forests.

Regeneration areas are designed to follow natural boundaries as much as possible. This way they will blend in with the landscape of the surrounding terrain and forest. Photo by Lauri Karvonen.

REGENERATION SECURES THE EMERGENCE OF A NEW TREE GENERATION

In multiple-use forests, silviculture is generally based on regeneration fellings followed by a regeneration phase, and then tending of seedling stands and thinnings. In forest regeneration it is important to select the correct regeneration and site preparation methods as well as tree species that are suited to the site. These decisions will secure the establishment and good early development of the seedlings in the regeneration area.

Forests are usually regenerated either naturally, using seed-tree felling, or by clear-felling followed by sowing or planting. Existing viable seedlings and seedling groups are utilised when establishing a new stand. In regeneration areas, forest cover is also maintained by groups of retention trees and single trees left in them.

The site preparation methods used are as light as possible but sufficient to facilitate regeneration. It is also important to identify poor sites that will allow seedling establishment without preparation. Buffer zones are left along water bodies to prevent any leaching of nutrients from regeneration areas.

SILVICULTURE HELPS MAINTAIN A DIVERSE FOREST ENVIRONMENT

In the tending of seedling stands and thinnings, the growth density of a stand is regulated by removing trees, including poor and damaged ones. This is a way to promote the vitality, quality and diameter growth of the remaining trees. In a conifer stand, the proportion of broadleaves is retained at 10–30%, depending on the site. During the growth phase, the variation in internal stand structure is maintained by leaving small thickets, for example in wet depressions or rocky sites, and by avoiding unnecessary clearing of undergrowth. Junipers, rowans, goat willows and small groups of alder are also saved. Groups of retention trees and single trees left earlier in the regeneration phase create variation in stand layers.

Depending on the site, broadleaved trees should be retained in all phases of stand management. Photo by Jari Kostet.

In gap felling, new gaps can be made after the seedling stands in previous gaps have reached the height of 2–4 metres. A newly-made gap seen in the background. Photo by Lauri Karvonen.

PRESERVING FOREST COVER AND LANDSCAPE CHARACTER WITH SPECIAL FELLINGS

Special fellings are applied if the site has, for example, such biodiversity, recreational or landscape values that require preserving its forest cover. Special felling regimes include mature thinning, retention felling, uneven-aged methods and gap felling.

Mature thinning means the thinning of mature (regeneration-ready) forest. Mature thinning may be used to maintain forest cover while promoting the generation of a new seedling stand. After the seedlings are established, the seedling stand can be grown for some time under the seed or shelterwood trees, thereby avoiding an open regeneration phase.

Retention felling is a regeneration felling that leaves clearly more retention trees than usual. It can be applied to landscape sites or sites aimed at increasing the amount of deadwood in the long term.

Uneven-aged management methods create and maintain an uneven-aged forest character and forest cover. In uneven-aged felling, the forest is managed by treating groups of trees, while selective felling is mainly the removal of single trees. In both methods, trees are removed on a small scale and the forest is both regenerated and grown simultaneously. In other words, there are trees of many ages and sizes growing continuously on the site.

In gap felling, the site is regenerated in stages and preserving the landscape character, making small gaps that vary in size and shape. Generally, gap felling is applied to 20–25% of the total area of the site. In southern Finland the gaps are up to 0.5 hectares in size, while further north the maximum size of a gap is one hectare.

FOREST BIOMASS IS HARVESTED WITH CONSIDERATION FOR THE ENVIRONMENT

Wood-based energy is a way to replace the use of non-renewable fossil fuels. Forest biomass is harvested following the same principles of biodiversity maintenance, water protection and landscape management as applied to any other wood harvesting.

Forest biomass may include thinning wood from young stands, residues from regeneration areas, wood from otherfellings that is unsuitable for processing as well as stumps. At Metsähallitus, forest biomass is generally harvested in thinnings as small-diameter stemwood, leaving the branches and needles in the forest. The method can be applied on all sites as it will not affect the nutrient status of the soil. Residues and stumps are harvested only on suitable sites, and a sufficient amount of them is always left behind. Harvesting is focused on spruce stands in southern Finland, near the plants using forest energy.

Small-diameter thinning wood is increasingly important in renewable energy production. Photo by Lauri Karvonen.

GAME ANIMALS ARE GIVEN ATTENTION IN FOREST MANAGEMENT

In multiple-use forests, management activities are carried out with a view to safeguarding the living conditions of game animals and keeping their populations vital and available for hunting. The abundance of game animals depends on the quantity and quality of suitable habitats. Therefore, all forest operations should be performed bearing in mind the structural features of habitats for various game animals. This will bring extensive and long-term benefits for the well-being of game animals, securing vital populations of most species. However, special planning is required to preserve the characteristic features of capercaillie lekking sites.

Habitats for grouse

The management of grouse populations is essentially the management of their breeding habitats. Even though the requirements of various species are somewhat different, the common objective in habitat management is a variable mixed forest with undergrowth and plenty of dwarf shrubs. Desired structural features include variation in tree and shrub layer height and density as well as tree species.

Undergrowth and game thickets left in regeneration areas significantly improve the preservation of grouse nests and provides shelter for both chicks and adult birds. Therefore, unnecessary clearing of undergrowth is avoided.

In order to ensure winter feed for the black grouse, groups of birch are left around regeneration areas and other open areas as well as seedling stands. Habitats for the hazel grouse are secured by saving groups of alder, birch and spruce in the tending of seedling stands and fellings.

Willow grouse in winter plumage. Photo by Timo Eskola.

The capercaillie requires forests of varying density and with sufficient undergrowth. Photo by Jari Kostet.

The capercaillie holds a special status

Regarding habitat management in multiple-use forests, the capercaillie is a species of special importance. Therefore, the management of capercaillie lekking sites has a special status in habitat management for game animals, and Metsähallitus has issued specific guidelines for this.

The capercaillie prefers advanced forests, but will not necessarily require an old-growth forest as it also thrives in thinning stands. Varying tree density and sufficient undergrowth are important forest structural features. Since the capercaillie feeds mainly on pine needles in winter, feeding pines are spared, as well as other pines with sturdy branches as roost trees.

Forest cover is an important landscape factor for the capercaillie. The annual territory of an individual may cover hundreds of hectares. Different types of habitats for various seasons of the year should be provided to the capercaillie.

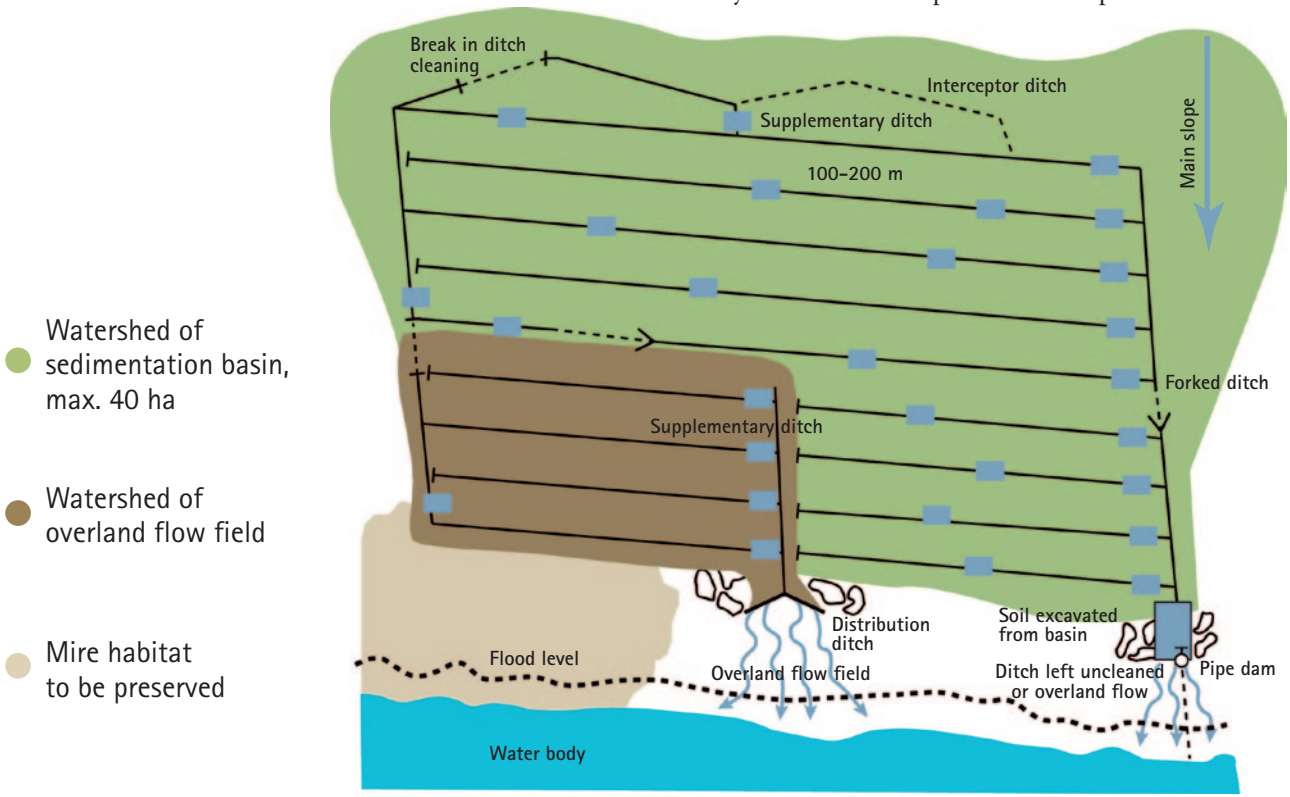
In regeneration phase stands, the preservation of capercaillie leks is secured by careful and gradual fellings. In thinning stands, however, lekking sites may be thinned normally so they will not grow too dense for the capercaillie.

A MULTITUDE OF MEASURES FOR WATER PROTECTION

Ditch network maintenance (ditch cleaning and supplementary ditching), felling and site preparation may have impacts on the volumes of runoff water from forest areas. Water protection measures in forestry are an attempt to prevent an increase in leaching of solids and nutrients with runoff, and to clarify runoff as effectively as possible.

Water body load is controlled with a series of successive measures

Standard water protection measures taken by Metsähallitus include the basic structures of ditch network maintenance (silt traps, breaks in cleaning and digging, sedimentation basins), buffer zones in felling and site preparation areas, buffer strips in fertilisation as well as minor overland flows. Ditch network maintenance plans always include a water protection component.



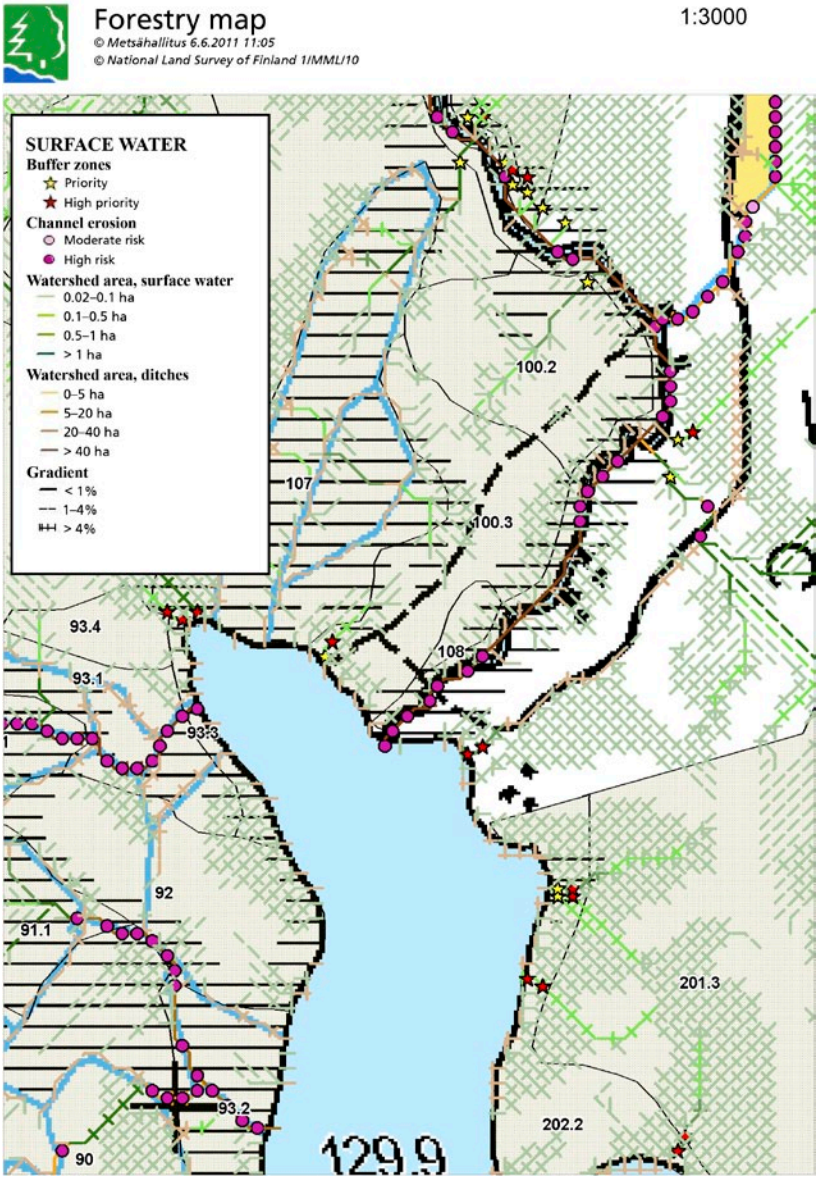
If necessary and conditions permitting, additional measures such as overland flow fields, flow control and submerged dams as well as wetlands are used. Further measures may also involve intensified planning, for example geographic information analysis or review at the watershed level.

GEOGRAPHIC INFORMATION ANALYSIS SUPPORTS WATER PROTECTION PLANNING

Metsähallitus uses maps produced by the GIS application to support water protection planning. Printed maps illustrate the gradient of ditches in the target area as well as the watershed area and flow rate of the water carried by the ditches. This is also a way to estimate the erodibility of ditches and the need for various water protection measures, especially in areas of ditch network maintenance.

Watershed planning

Watershed analysis is a method for estimating the total load caused by felling, site preparation, ditch network maintenance and fertilisation operations in a selected watershed. Furthermore, it is possible to assess how effectively various water protection measures can reduce this load. Watershed planning is used especially in sensitive areas in terms of water protection.



A thematic map of surface water illustrates the flows of surface water and indicates things such as priorities for buffer zones.

SURVEY AND MANAGEMENT OF CULTURAL HERITAGE SITES

Cultural heritage sites in forests include ancient monuments protected under the Antiquities Act as well as other sites outside legislation. Examples of these are old dwellings and graves, sacrificial sites, ancient roads with their markers, hunting pits and rock paintings. Forests also have a countless number of clearance cairns as well as tar-burning pits and charcoal kilns.

How cultural heritage sites are observed in forestry

Metsähallitus has collected information about cultural heritage sites located in state-owned forest areas. Recorded in the GIS, this information is continuously updated during forest planning. In addition, Metsähallitus launched an extensive cultural heritage field survey project in 2010. The aim is to survey the cultural heritage sites in state forests by the year 2015.

An ancient monument is not normally an impediment to forestry operations, but it is necessary to consult an expert in the planning phase. Often attending to a site requires treating the forest, for example removing the trees and shrubs to expose the site and taking away the residues.

Ancient boundary marker between the Lapps and Finns in Puntarikero, recorded by Inga Nieminen and Timo Simontaival. Photo by Taisto Karjalainen.

MULTIPLE-USE FORESTS ARE A SOURCE OF RECREATION AND WELL-BEING

Metsähallitus manages all of its forests under the multiple-use principle, which enables extensive and versatile uses for tourism and recreation in forestry areas. Some of the most common forms of recreation include picking berries and mushrooms and hunting. Tourism and outdoor activity services as well as hiking, cross-country skiing and snowmobile trails are often located in multiple-use forests. In tourism centres, recreational forests and national hiking areas, special attention is given to landscape management and preservation of natural beauty values. By planning touring and hiking routes in co-operation with municipalities, tourism businesses and other actors, it is possible to focus special forestry measures on the busiest areas and in the vicinity of services.

In the Ruunaa Hiking Area, special efforts have been made to provide recreational facilities. Photo by Sari Hiltunen.

REINDEER HUSBANDRY IS WIDELY PRACTISED IN FORESTRY AREAS

In Finland, the conditions for practising reindeer husbandry are laid down in the Reindeer Husbandry Act. As much as 82% of state-owned land is located in the reindeer herding area. Significant forestry operations and other activities with substantial effects on reindeer herding are negotiated with the relevant reindeer herding co-operative. The northern part of the reindeer herding area is also "an area specifically intended for reindeer herding", where the land may not be used in a manner that may significantly hinder reindeer herding.

Forestry and reindeer herding have impacts on each other, but the two livelihoods can co-exist in the same areas as long as the co-operation procedures are in place. Significant areas for reindeer husbandry, where forest management methods are critical, include winter pastures and calving areas, reindeer transport routes as well as the surroundings of reindeer fences and round-up places.

The needs of the livelihoods are reconciled through negotiation

Metsähallitus and the Association of Reindeer Herding Co-operatives have signed a co-operation agreement which defines the ways of reconciling forestry and reindeer husbandry. Regarding forests that are important for reindeer husbandry, felling and site preparation plans as well as ditch network maintenance and road construction plans are discussed in annual negotiations with the relevant reindeer herding co-operatives, giving them the opportunity to influence the contents of the plans. On the basis of a reindeer herding co-operative's proposal, it is possible to jointly agree on rescheduling fellings on key pasturelands over the annual cycle (tree lichen sites for late winter), or on restricting fellings for a number of years. Site preparation is carried out using the lightest methods possible, and lichen grounds of winter pastures are not treated at all.

The needs and ways of reconciling forestry and reindeer husbandry vary with the working methods of reindeer herding co-operatives. Winter feeding is a way to control reindeer grazing and to ensure steady production of meat in variable weather conditions. Photo by Kii Korhonen.

Preserving the Sámi languages and traditions in a changing world requires work in many fields in order to secure the Sámi culture. Gaccepat of Karigasniemi performing at the Young Sámi Art Event in 2010. Photo by Tanja Sanila.

THE SÁMI CULTURE HAS A SPECIAL ROLE IN UPPER LAPLAND

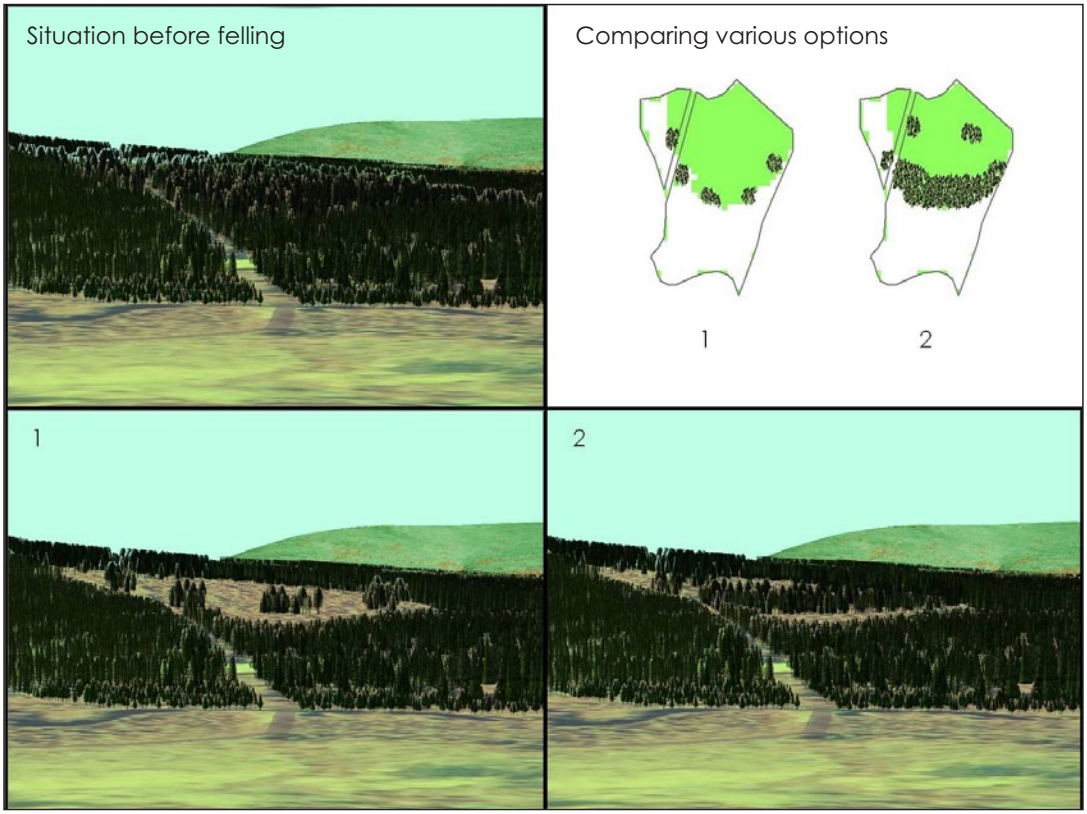
The Sámi are the only recognised indigenous people within the European Union. Three types of Sámi languages are spoken in Finland: the Northern Sámi, the Inari Sámi and the Skolt Sámi. Metsähallitus promotes the preservation of the Sámi languages through its work and communication. The Sámi traditional livelihoods include reindeer herding, fishing, hunting, small-scale agriculture and forestry, gathering of natural products as well as crafts. These livelihoods are still highly significant in terms of preserving the Sámi culture, even though the modern-day Sámi are widely active in various sectors of society and business.

Regarding forestry on state land in the Sámi homeland region, the same negotiation procedures with the relevant reindeer herding co-operatives are followed as elsewhere in the reindeer herding area. In addition, key plans influencing the scale and policies of forestry are negotiated with the Sámi Parliament and, in the Skolt Sámi area, with the Skolt Council. The principles of forestry in the Sámi region have been agreed in negotiations between Metsähallitus, the Sámi Parliament and the Skolt Council. Specific agreements have been made with the reindeer herding co-operatives of the Sámi region on the use of forestry areas and on the exclusion of the most important pasturelands from forestry operations for a period of 20 years.

FOREST MANAGEMENT FOR A VARIETY OF LANDSCAPES

Site-based forest management produces a variety of landscapes. Recreational and landscape values are preserved through careful planning and implementation of forestry operations. Design of felling areas, placing of retention tree groups, opening up of scenically valuable views and highlighting special sites are ways of forest management to preserve landscape values. The diversity of the forest character is also enhanced by an abundance of broad-leaves and variation in tree species. In northern Finland, the wilderness character of landscapes needed for tourism can be preserved by gap fellings and mature thinnings that maintain the forest cover.

When working on sites that are used for recreation, trails and routes are kept intact and cleared of residues. In popular recreational sites, fellings are performed outside the season if possible.



Visualisation is a way to illustrate, for example, the landscape effects of retention trees left in regeneration felling. In option 1, retention trees are left in groups, and in option 2, partly as a long strip and partly in groups.

PLANNING OF FOREST USE IS A COLLABORATIVE PROCESS

In Finland, the statutory planning that drives the co-ordination of livelihoods and land use is the responsibility of Regional Councils and municipalities. In addition, Metsähallitus plans land use and operational policies on state land through its natural resource plans, drawn up together with regional and local stakeholders. Before the preparation of a natural resource plan, the stakeholders elect a collaborative team to represent various actors, and to create and select different planning options. All interested people are given the opportunity to have a say through online feedback and public events. Felling plans are presented as necessary, for example to village committees, environmental organisations or tourism businesses. In the reindeer herding area, the co-operation procedures with reindeer herding co-operatives are applicable to all felling sites.

All messages received are responded to. They are recorded in the feedback system and analysed regularly.

In participatory events, local residents have the opportunity to give feedback and express their wishes concerning felling plans. Shown above, a public event held in Suomussalmi in 2008. Photo by Ari Holappa.

Photo by Jari Kostet.

The contents of this leaflet are based on the publication "Metsähallituksen metsätalouden ympäristöopas" (Metsähallitus environmental guide for forestry). Prepared in co-operation with WWF Finland, the environmental guide includes comprehensive guidelines for safeguarding biodiversity and forest ecosystem services in forestry areas.

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