An application of ecosystem approach in Finland

Landscape ecological forest management planning
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1. Introduction: duties, responsibilities and resources of Metsähallitus

Metsähallitus is a state enterprise responsible for managing most of the state-owned forests in Finland, a land area of nearly 9 million hectares. State forests are mostly located in northern and eastern Finland on less productive soils. The state forests are used for protection, recreational and commercial purposes.

Forestry lands		Protected, wilderness and other areas			
Forest land	Non- and low-productive land	Statutory protected areas	Areas reserved for protection	Wilderness areas	Other areas
3,341,000 ha	1,453,000 ha	1,241,825 ha	481,100 ha	1,378,600 ha	885,000 ha

Table 1. Land-use of areas administered by Metsähallitus

Forestry lands are managed by the Forestry business unit of Metsähallitus for commercial purposes according to the principles of multiple use and sound environmental management. The Forestry business unit provides timber commodities complete with haulage services as required by its customers, which include major Finnish forest industry enterprises and various sawmills. The 1999 turnover of the Forestry business unit was EUR 194 million, some 90% of the total turnover of Metsähallitus. The land resource of the Forestry business unit is 3.3 mill. ha., i.e. the forest land in Table 1.

The protected, wilderness and recreational areas are managed by the Natural Heritage Services of Metsähallitus. The nature conservation and recreational services functions of Metsähallitus are mainly financed from the Finnish State budget. More than EUR 16.8 mill. was spent on nature conservation and EUR 5.4 mill. on recreational services in 1999.

The total number of employees in 1999 was 2150 persons. 1800 persons were employed by Metsähallitus business units, mainly forestry and 350 persons were employed for societal tasks, mainly for management of protected areas.

2. Landscape ecological planning: process description

2.1 Background

The development of Landscape Ecological Planning in Finland started as a cooperative project between Metsähallitus and the Finnish Environment Institute in 1994. The Finnish Environment Institute (FEI) is the national environmental research and development centre of the environmental administration. The biodiversity assessment part of the planning method has been developed in a separate research project. The practical planning method has taken shape in the course of pilot projects, which were started in areas administered by Metsähallitus in 1996. The

principles of participatory planning have also been applied from the start. In this way local residents, nature lovers and other interested parties have been able to give direct feedback to the compilers of the individual plans.

A specialist working group convened by Metsähallitus and made up of researchers and representatives of the various interest groups has supported the planning development work. In addition, extensive research on Landscape Ecological Planning is currently under way in Finland, and its results can be utilised in further development of the planning method. This means that the planning method is constantly being updated not only through experience gained in practice but also with new research information.

2.2. Landscape Ecological Planning as applied in Metsähallitus

Landscape Ecological Planning is integrated forest management planning, in which ecological goals are aligned with different forms of forest use, while bearing in mind the objectives of forestry in the area. Landscape Ecological Planning views an extensive forest area as a whole including managed forests, nature conservation areas, game areas and special areas for recreational use.

The long-term objective of Landscape Ecological Planning is to assure the survival of the area's native species as viable populations. Among other things, this requires the conservation of existing valuable habitats and ensuring that new ones can evolve. In this way the planning contributes to the continued existence of valuable habitats as defined in the Forest Act and Nature Conservation Act in Finland. Planning can also be used to focus nature management activities including restorational operations on the sites that are the most crucial in ecological terms. The planning also involves the effort to assure the conditions for the spread of various species. In this effort, the valuable habitats and ecological links in managed forests complement and enhance already existing nature conservation areas. Together these form an ecological network, which preserves biodiversity.

Another central goal of planning is to ensure that the conditions exist for multiple forest uses and for nature-based sources of livelihood. The procedure thus involves inventories of game habitats, scenic values and cultural, educational and research sites. In Northern Finland, the demands of reindeer husbandry play an important role. The weight given in planning to recreational use depends on the characteristic features of the area and on the recreational needs of the region.

Landscape Ecological Plans are drawn in an open, interactive and people oriented way. The participatory management as applied in the Landscape Ecological Planning include informing, gathering value based and geographic input, talking with the stakeholders and the public and giving them feedback. The aim is to improve the working relationship with all those stakeholder groups and citizens interested in the use of state lands and in the Landscape Ecological Planning of Metsähallitus. For this purpose open houses and working groups of stakeholders are arranged during the planning process. All public input is documented, analysed and, if feasible, taken into account. It is envisaged that through participatory management Metsähallitus will take care of the common property in a broadly acceptable way.

3. Landscape ecological planning: project

The planning is carried out by the business units of Metsähallitus as separate projects for each individual planning area. Each project team includes representatives of the Forestry unit and Natural Heritage Services. The wildlife and fishing and tourism specialists of Metsähallitus also participate in planning. The project leader usually comes from the Forestry unit.

According to the principles of participatory planning, a cooperation group is set up, if possible consisting of representatives of the various interest groups. It may be expedient in some cases for the same group to coordinate several plans. Important cooperation partners include municipalities, Environment and Forestry Centres, forest industry companies, nature organisations, reindeer owners' associations and other local interest groups.

The aim is usually to complete each of the projects within one year. However, more extensive plans may be carried out in stages over several years. Decision making is usually based on a consensus between the project leader and the experts coming from other business units of Metsähallitus. Regional heads of Metsähallitus business units approve the completed plans.

The final aim is to include 6.4 mill. ha of land in landscape ecological planning. All areas administered by Metsähallitus will be covered by LEP by the end of the year 2000, except the northernmost lands beyond the tree growth limit in Lapland. Altogether more than 100 individual plans will be drawn up.

More than 100 persons, including more than 20 professional biologists, have participated in the field work during the past 5 years. The costs of this work totalled EUR 6.5 million. The results, including the map material, are published as landscape ecological plans and they are available on request from Metsähallitus for a nominal price.

4. Landscape ecological planning: results

The total area of completed LEP's is more than 5 mill. ha's at the moment. Some 2.5 mill ha's of this area is standard production forest by land use. So far 123,600 ha of productive forest land has been designated as key-biotopes and ecological corridors. Commercial forestry activities will no longer be carried out in the area. This area increases the strictly protected forest area in Finland by 17 %. Furthermore, 199,700 ha of productive forest land subject to conservative forestry activities has been designated as an area subject to an extended rotation period (extension by 1.5 or 1.7 times the regular rotation period). These areas consist mainly of valuable scenic areas such as riparian forests and important game areas such as Capercaillie leks.

The information is stored in the GIS of Metsähallitus where it is maintained and updated and made available for use at any time for any purpose.

At the moment the age-class and site-class distribution of key-biotopes and ecological corridors

(123,600 ha) compared with that of commercial forest land (3.3 mill. ha) is as follows:

Age-Class	Key-biotopes	Commercial forest land	Site-Class	Key-biotopes	Commercial forest land
0-20	3.8%	19.1%	Herb-rich	11.5%	1.4%
21-40	7.1%	24.6%	Mesic	54.0%	24.6%
41-60	8.5%	18.4%	Moderately dry	28.2%	57.6%
61-80	6.1%	9.4%	Dry	6.3%	16.4%
81-100	6.0%	4.0%			
101-120	5.8%	3.2%			
121-140	9.2%	4.3%			
141 +	53.6%	17.0%			

Table 2. Age-class and site-class distribution of key-biotopes and ecological corridors vs. commercial forest land.

It is obvious that the positive impact of the key-biotopes and ecological corridors on biodiversity is higher than their proportion of the commercial forest land area, since they are based on a systematic analysis and field inventory of the nature values of the each individual LEP area. These areas are concentrated on older forest stands on more fertile sites than the commercial forest land in general. These stands are the most valuable ones in economic terms as well. The key-biotopes, ecological corridors and stands subject to the extended rotation periods reduce the annual cutting budget of Metsähallitus by 12%. In other words the investment on nature conservation, recreational, cultural and other values reduces the business turnover of Metsähallitus annually by EUR 20 mill.

5. Landscape ecological planning: implementation

LEP's are implemented by forestry operations. It is essential how areas surrounding key biotopes and other important habitats are managed in space and time. Typical production forest can provide a lot of support to special areas especially if well managed. Training of the staff of Metsähallitus has already been started. Training has been concentrated on the treatment of special areas and on the operation on adjacent forest stands. The management design of LEP is strongly supported by Environmental guidelines to Practical Forest Management of Metsähallitus. These guidelines determine eg. small-scale key biotopes which are to be preserved in the forestry operations. They include also instructions for prescribed burning, retention trees, protection of water bodies, etc.

6. Landscape ecological planning: monitoring, review and evaluation

The information for each planning area is stored separately. The compartment-specific data on the special features and map locations are saved in their own separate files. The records and other documents produced in the course of the planning process should also be stored.

The data on the geographical information system are kept up to date by entering any changes to compartment-specific information. The system can thus be used for monitoring the implementation of the Landscape Ecological Plan. The implementation of areal targets is monitored in 5-year periods. The preservation of valuable habitats and other sites of special value, and the volume of retention trees left in cuts, are monitored annually by ecological follow-up inventories based on random sampling. The planning data are supplemented as new sites are identified. The new data on sites of special value are recorded in the geographical information system.

The plan will be reviewed after five years at the latest. The review will be arranged in line with the principles of participatory planning. The follow-up review will chart the present status of implementation and the action necessary to update the plan and to achieve the goals set. If necessary, additional inventories will be arranged to chart the implementation status. The objectives of Landscape Ecological Planning will also be reviewed in the context of new research. The review should state any new land use decisions, new research results and the feedback received on operations, which are then used as a basis for evaluating whether the plan is up to date and for making any necessary changes to the plan. Any changes to the threatened species classification should also be allowed for in the evaluation of the plans. The plans will be modified based on the review. New inventories and other research will be done if necessary. Review is followed by the next period of implementation.

At the moment the landscape ecological planning procedure is under evaluation by an independent party, the Helsinki Consulting Group. The evaluation is to cover all aspects of sustainability: social, ecological, economic and cultural matters. The evaluation team is headed by Mr. Jari Niemelä the professor of Ecology and Systematics at the University of Helsinki.

The evaluation is to be completed by the end of January 2001 after which a public seminar on the results will be arranged in Helsinki. The results of the evaluation will be taken into account in the future development of Landscape Ecological Planning.