

FEATURES OF THE SUSTAINABLE FOREST MANAGEMENT THAT CAN BE IMPLEMENTED ON THE LAND OF THE PROJECTED PROTECTED LANDSCAPES IN WESTERN MECSEK

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Abstract

The sustainable forest management is part of the sustainable development, which is an important task nowadays. Principles of the sustainable forest management have to apply on the projected Protected Landscapes in Western Mecsek, when these protected landscapes will formed. The goal of it is to preserve the silviculture under the nature conservation, and to keep the forests of the area in a nature-close state.

Introduction

The projected Protected Landscapes in Western Mecsek includes major part of Western Mecsek. Its southern part basically consists of sandstone, while its northern part is dominated by karstifying limestone. At present four nature reserves can be found within the land of the planned landscape-protection area: the Jakab Hill, Melegmány Valley, Pintér Garden and the Cave of Abaliget.

On FAO conference held in Buenos Aires in 1972 there was set the goal of achieving the realisation of the triple function of forests, which includes the achievement of production/management, environmental protection and recreation/public welfare goals. As long-term objective the sustainable forest management was aimed at, which is important part of the sustainable development of the landscape.

Hungary made the sustainable forest management a principle to be followed officially in the Act on Forests No. LIII. of year 1996. According to the act the sustainable forest management means that the forest is utilised to such extent, which ensures the conditions of management for the future generations too, in a way, that the forest preserves its great biological variety, nature-closeness, recurring ability, vitality, as well as fulfils its triple function of production, environmental protection (preservation of the ecosystem, protection of the soil and climate), and recreation.

Sustainable forest management methods

Forest management is a dual activity, which contains both the silviculture and the forest use. The former one means timber production and plant protection, and the latter one means wood-felling and cutting, secondary use, and background infrastructure.

The most important principles of managing forests being under nature conservation are as follows [1]; [2]:

- Ensuring the survival of the natural forest associations.
- Performing regeneration from seeds in natural way instead of regeneration from stump by sprouting.
- Applying native species of trees.
- The area of final wood-felling may not exceed 10 hectares.
- Clear-felling is allowed only at places, where there is no other way for regeneration, and its area may not exceed 5 hectares.
- Cutting age must be raised.
- The use of plant-protecting agents must be restricted.

Forest management has important environmental protection duties, which go beyond nature conservation [3].

Forests extract considerable amount of carbon from the air. Beside carbon fixation forests also play important role in oxygen production and dust deposition.

Soil conservation, which mostly means the protection against erosive damages, is important duty of the forests. According to it, cutting age is postponed as long as the stock is able to ensure the protection of the soil, which is about 100 years.

The realisation of *landscape protection goal* means the preservation of the original view of the landscape primarily by *avoiding clear-fellings*.

Forest management can also be connected to *settlement protection*. Forests *moderate the weather extremities, improve microclimate, reduce air pollution*, and furthermore the field protecting forest belts and urban forests protect the settlements.

Karstic water protection may be important part of protection. This comes to the front to a greater extent in Western Mecsek, where major part of the planned landscape-protection area consists of karst.

From water protection aspect within the land of Western Mecsek there can be hazard points the municipal waste of Orfű and Abaliget, as well as the smaller extension ploughlands of their environment and the horse farm lying beside Orfű. In addition, the Petőczpuszta works and air-shaft of Plant No. IV. of Mecsek Ore Mines should also be considered as pollution source. However, its significance keeps on decreasing since the reduction of uranium mining.

Future directions of forest management

Formerly, the basic objectives of forest management were increasing the productivity of the forests and improving the timber quality. The *duties of the sustainable* or in other words *long-lasting and environmental forest management* can be classified around three fields [4]:

1) *Surveying the environmental hazards* that threaten the forests and *reducing the expected damages*. Such hazards can be the forest destruction, air pollution, forest fires, diseases, etc. For this survey the natural and deteriorated state of the forests should be recorded, which provides a base for comparison for future investigations. The determination of the natural state is based on the individual characteristics of the plant species, which compose the vegetation type (eg. natural species or species referring to degradation). On this base rating the naturalness values from 1 to 5 the following categories were set up: artificial, strongly transformed, moderately transformed, nature-close and natural forests [5].

2) *Reviewing and developing the technologies* and processes applied in forest management *in order to decrease the damages* the management may cause.

3) Improving and spreading those forestry methods that are useful for environmental protection, environment management and environment development.

The most important duty is to transform the traditional management into nature-close management [6]. There must be given up the practice of using the forest rarely, but by cutting large volume of trees then.

Forest parts of the same age are not desirable, 40-50 years age difference is desirable from the aspect of both ensuring even timber output and landscape aesthetics.

Occasionally there can be applied the *selection felling operation*, which has the advantage that from year to year getting back to the forest part only the volume equal to the annual increment is cut.

It is important, that the *wild beasts should not exceed the alimending ability of the forests.*

There must be maintained the *recreation function of the forests*, by restricting its environment burdening effects, which means eg. that car traffic must be driven out from the forests.

For applying these principles in practice, there is a need for landscape management, and within it for managing the forest landscapes. The forest landscape management is the management approach of the forest landscape, which includes the communal and ecological interests, such as preserving biodiversity, the production-capacity, health state and vitality of the forest ecosystem controlled by the structure and dynamics of the landscape [7].

The principles of the forest landscape management include the involvement of the society (users of the land and decision-makers), as well as the extensive consideration of the ecosystem's aspects. The internal structure, rules, behaviour of the forests must be examined dynamically, which creates the balance among the physical, biological and human dimensions [8].

Features of the nature-close forest management in the Western Mecsek

Within the projected Protected Landscapes in the Western Mecsek at present there are two major areas that enjoy protection, the Nature Reserve of Jakab Hill and the Nature Reserve of Melegmány. On these areas due to the protection, the wood-felling and cutting is restricted even at present, which meets the requirements of the nature-close forest management. Apart from the protected areas, the wood-felling is restricted altogether in 146 other forest parts. The reason behind it is partly the protection against the erosion on the steep slopes, which primarily concerns the areas lying to the south from Jakab Hill and to the north from Cserkút. The strengthening of the gullies is connected to the protection against erosion. It provides the main reason for restriction in the case of Zsuppon-parlag that is located to the north from Misina. Thirdly, for ensuring the sport, turistic, holiday and recreation goal the wood-felling is also restricted altogether in case of 127 forest parts. The achievement of this goal primarily concerns the so-called "urban forests", which means the southern side of Misina and Tubes lying to the north from Pécs and the Éger Valley. The Cigányföld located to the east from Orfű and the area lying to the east from Melegmány are restricted for similar reasons. These restrictions serve the realisation of environmental and recreation goals included among the goals of the sustainable forest management, while the non-restricted areas serve the realisation of production goals.

By extending the protected areas the restriction of wood-felling will concern larger area, however the establishment of the landscape-protection area does not mean the total cessation of production, but will imply the obligation of applying the environment saving technologies widely.

One of the reasons behind establishing the projected landscapes is the naturalness state of the forests covering the area. The forests are in nature-close state, where the human intervention is not considerable.

In Western Mecsek we can distinguish four major *natural forest associations, beech-groves, hornbeam and chestnut oak-groves, chestnut oak-groves and Turkey oak-groves.* In the case of these natural forest associations management is done according to the considerations of the nature-like forest management. In such cases, the forest is managed by imitating the processes taking place in the nature. Wood-felling and cutting, caring and forestation are also made this time, but their intensity is moderate, their means and technologies are gently, and returns are frequent.

The beech-groves, hornbeam and chestnut oak-groves, chestnut oak-groves are regenerated in natural way, but the Turkey oak-groves are treated with clear-felling and artificial forestation, since they get renewed very poor in natural way. There are such forests too, which can be considered natural, but are *not suitable for the habitat's potential.* Most of them are unsuccessful or consequence of a missed intervention, these are the so-called *spoilt forests.* This problem can be cured by structural change, or post-clear-felling artificial regeneration. In Western Mecsek the area of these forests do not reach 100 hectares.

In Western Mecsek considering the way of regeneration the following area rates can be defined in terms of the natural forests according to the forestry data:

Forest type	Natural	Artificial	Total area
Beech-grove	99	1	32
Hornbeam and chestnut oak-grove	77	33	31
Chestnut oak-grove	81	19	16
Turkey oak-grove	0	100	10

Table 1 Distribution of the regeneration methods in the natural forests within the area of Western Mecsek (%)

It can be seen from the table, that *in the case of forests occupying near 90% of the area the natural regeneration is prevailing.* The only exception is the Turkey oak grove that is difficult to regenerate. Furthermore, it can be also seen that almost the entire area of Western Mecsek (89%) is covered by the natural forest associations mentioned in the table. In the remaining 11% there are also natural associations, such as chine forest or karstic bush forest, and the other hard leafy forest spots that cannot be considered natural on the area counts only for a small proportion.

Beside the naturalness index *the nature-close state of the forests of this area is verified by the chemical reaction, lime and heavy metal content examinations of the soil, the vegetation analysis based on ecological indecies, and the examination of the comparison of the prevailing soil types and flora.* Figure 1 illustrates the map that was made as result of this comparison.

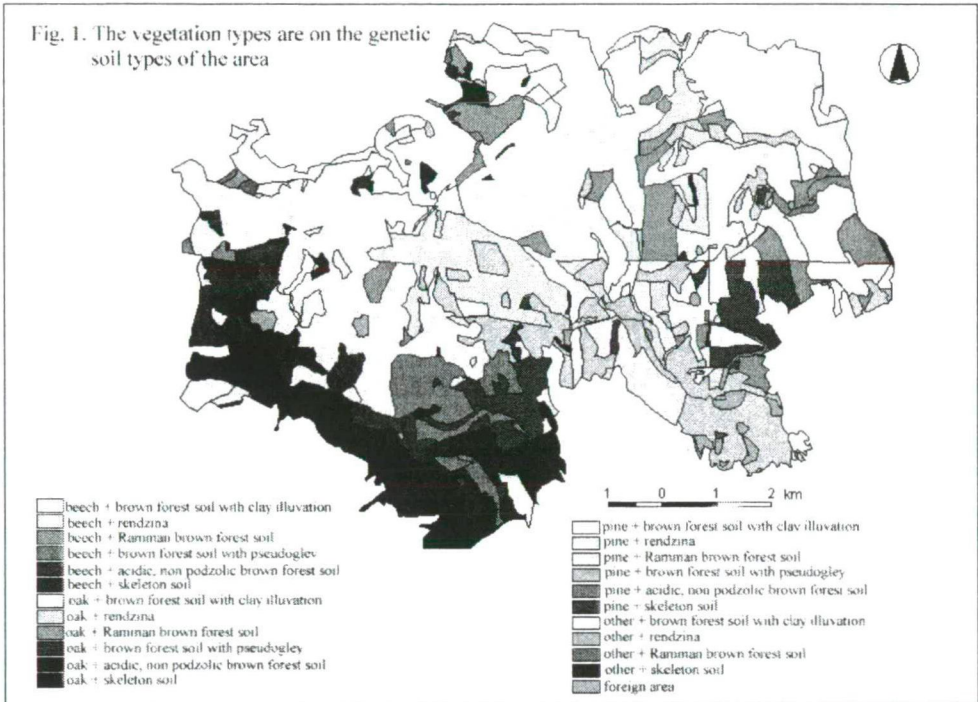


Figure 1 The vegetation types and the genetic soil types

By analysing the map it can be stated that *beech-groves* appear with the largest extension on the area, *on brown forest soil with clay illuvation*, majority of which can be found on the northern, *karstic area*. However *beech-groves* and *oak-groves* are climate zonal associations that can be found on all prevailing soil types of the area. *Their spread is connected rather to the exposure and slope conditions, than to the soil types.*

On the southern part of the area, primarily connected to the *southern exposure*, oak-groves can be found, mostly *on strongly acidic, non-podzolic brown forest soil* that formed on sandstone. The *skeleton soils* are connected to steep slopes, *areas with large angle of slope* (eg. southern side of Jakab Hill), where due to the exposure partly *oak-groves*, and due to the shallow thin tilth partly *planted pinewood* can be found.

The *rendzina* connected to the limestone appears on the *northern areas*, mainly with *beeches*. On the sandstone of the southern part primarily pseudogley, and strongly acidic, non-podzolic brown forest soils were formed, to which depending on the exposure oak-grove and beech-grove associations connect.

Regarding the flora, the pine spots and the Ramman-type brown forest soil appears in small extension. The pinewood is mainly planted bog-spruces, which do not belong to the native associations of the area. Their plantation served the protection against erosion on the steep areas, therefore their presence cannot be considered harmful. However, on those areas where the soil type and the angle of slope enable it (see: “urban forests”), it is reasonable to change them anyway.

Conclusions

Elaborating the principles of the sustainable forest management and applying it in practice on the protected forest areas, especially on the environment-sensitive karstic areas constitute an indispensable part of the sustainable growth, which is frequently mentioned nowadays.

- The *projected Protected Landscapes in Western Mecsek* is almost entirely covered by forest, the majority of which is in nature-close state. It is especially true for the northern, limestone composed karstic part of the area, which is free from the turistic overload of the "urban forests" located near to Pécs, and the landscape-strange pinewood plantations made for the purpose of protecting the steep areas.
- From sensitivity aspect, *it is the karstic part of the area* that deserves larger attention, since at each points of the world, including Hungary too, a distinguished interest is given to the karstic areas, which are *especially sensitive* to the harmful external influences. This sensitivity supports the demand of the karst of Western Mecsek on protection, which is also justified by the naturalness state of the area's forests. On the triassic limestone of the area mainly brown forest soil with clay illuvation and rendzina can be found, to which prevalingly beech-groves and oak-groves connect mixed with hornbeam. These associations meet the conditions created by the lithographical, pedological and climatological characteristics of Western Mecsek.
- The consideration of the production, environmental and recreational triple function of the sustainable forest management in the protected parts of the area is already part of the present forest management. *The projection of the three functions to a larger area*, that the establishment of the landscape-protection area makes necessary anyway, *requires the improvement and spread of the nature-close methods and their application as wide as possible*, from the forest regeneration with native species up to fulfilling the settlement protection duties.

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