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Editorial Open Access

Challenges in Forest Management Planning

Henn Korjus*

Department of Forest Management, Estonian University of Life Sciences, Estonia

***Corresponding author:** Henn Korjus, Department of Forest Management, Estonian University of Life Sciences, Estonia, Tel: +3725140550; E-mail: henn.korjus@emu.ee

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Editorial

Public interest on forest related issues has been rising during the last decades. This has changed forest management planning to value different forest functions on more equal basis. Almost any planning situation is unique in problem setting and forests involved as well as it is based on long-term forecasts, models, simulations and assessment of risks. Several features of forests cannot be described with conventional forest data and new approaches are essential for assessment of these features. Forest management planning aims to propose a rational set and schedule of actions for the management of a forest property [1]. Most common objective is maximum economic yield under the sustainability constraints regarding to the wood production as well as nature conservation. But there are some other considerations and objectives in the planning process as well. By its nature, planning is hierarchical process with multiple objectives and several constraints and usually has no the only optimal solution. As we cannot predict the future precisely, there are many equally good solutions.

Modern forest research is based on a combination of field and computer experiments. This is assisted by technological progress and our enhanced understanding of ecological processes. Models include some level of abstraction by creating a system that is less complex than reality. Also, models and computers provide more ideal environment for experiments compared to field conditions. Adequate forest data and understanding of stand growth, yield and structure is a precondition for the effective modeling and planning. Empirical growth and yield models are used to support decision-making in forest management. Usually, these models use the data representing forest growth and dynamics in the past. Applications of models in simulating the growth and development assume that the future growing conditions are similar to the past [2]. Therefore, changes in the forest growth conditions can bias the simulated growth and development [3].

Gadow et al. [4] has developed adaptive planning ideas into the concept of forest design. In traditional forestry, treatment schedules are developed for specific forest types as standard for assumed conditions. Such Silviculture creates standardized forest stands and is not flexible if conditions change. Forest design uses “Multiple Path” approach. This theory assumes that stands can be managed by multiple choices of management activities as different management paths. Even for very complicated and uneven forest structures the realistic management paths can be proposed and simulated in a computer system and optimal solution for the whole entity can be found with linear programming or heuristics.

Assessment of forest naturalness is integrated to forest management planning as a complex issue including forest dynamics, large-scale disturbances, adaptation to changing environment and human influence. As almost all forests are human influenced, only certain levels of naturalness of an ecosystem may be estimated [5]. However, our ability to assess forest naturalness is important for supporting forest management and conservation decisions in practical forestry. Level of naturalness of a forest stand is difficult to evaluate by routine forest data assessment and therefore this is usually skipped or extremely simplified methods are used [6]. Definitions of forest naturalness are very different. Accumulation of standing and downed deadwood and forest structural properties are often important indicators in these definitions. Large variation of deadwood properties is characteristic to forests in the Baltic countries. Structural properties of a stand and its dynamics are becoming more important in forest management planning. Similar forest ecosystems may have large structural diversity. Assessment of individual tree mortality (rate, spatial pattern and causes) enhances evaluation of naturalness, succession stage and recent disturbances in a stand. As recent disturbances are almost always present at landscape level we expect a variety of tree mortality patterns and constant deadwood flow even on a landscape dominated by old-growth forests.

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