FORFUN: a computerized tool to create a ranking of relative importance for forest functions at stand scale

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Abstract

In the Italian tradition, forest management in the mountain environment has a strong multifunctionality also at stand scale. The silvicultural strategy should ensure both the owner's income and the other functions relevant for tourist economy (protection against natural hazards, landscape, wildlife conservation).

Management decisions must be optimized according to the relative importance that each function has in the same forest compartment (1 to 20 ha). FORFUN (FORest FUNctions) is a computerized tool designed to assign a score to the functions of the forest in a given forest compartment, ranking them in order of importance. To this end a multicriteria algorithm is employed using two criteria: site suitability and stand aptitude for the given functions. For each criterion and for each function a group of indicators represented as GIS layers was chosen. The two criteria can be attributed roughly the same weight as assessed by the planner. The result can be corrected with a coefficient expressing the relative importance assigned to each function by the stakeholders through questionnaires whose outcome are processed by a Saaty matrix. FORFUN was tested in two sub-regional scale forest plans (20,000 to 30,000 ha of forest area comprising several public and private forest ownerships) in the north-east of the Alps. The algorithm was applied to a total of 20,000 forest compartments in the two case studies. The use of the DSS allowed to obtain two main outputs: i) a map showing the prevailing function (first in the ranking) of any forest compartment; ii) a map for each forest functions showing the degree of importance of the function throughout the woodland. By varying the weight of criteria and taking into account whether or not the questionnaires, two planning scenarios were built that have fueled lively debates with the stakeholders making the participative process more effective. Both are proven very useful in addressing some conflicts related to the multifunctionality of planning.

Keywords: Decision support systems, Multifunctional forest management, Mountain forestry, Participation process

1 Introduction

Several and diverse goods and services are required to forest from society today. Some of them have significance only for local community, while others have important effects on the quality of life of large regions and in some cases are crucial in the global environmental balance.

Consequently, it is now common awareness that forest management should have multiple objectives aiming to maximize the overall flow of what local communities and society as a whole expect from the forest. To define this type of management the adjective multifunctional is used recalling the term *forest function* that expresses a concept not always unequivocally understood. Forest functions