

Assessment of the importance of silvicultural measures for maintaining multiple functions of mountain forests

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Within the framework of an investigation financed by the European Union and the Bavarian Forest Service 280 stands in two forest districts (Schliersee and Kreuth) in the Bavarian Alps were evaluated regarding their capacity to ensure (i) protection against natural hazards, (ii) nature conservation, (iii) recreation and (iv) timber production. The evaluation was based on the assessment of intensively managed stands, stands where silvicultural measures have taken place only sporadically and stands which have not been managed since 30 years and more. In addition the sample comprised stands with a species composition close to the respective potential vegetation type, but also other stands with different mixture and structure. Beyond this, stands of different stages (regeneration stage, tree stage, final stage) were considered. Stands of each possible combination of the criteria (i) degree of management, (ii) stand type and (iii) stand stage were grouped by infra-red aerial photographs and then selected randomly. The final assessment of the stands was done by an analysis of aerial photographs, data of the regular forest inventory provided by the Forest Service and an inspection beat. In doing so different stand characteristics were measured and estimated respectively. Each of these variables was finally weighted with regard to four functions mentioned above.

It could be shown that the capacity to protect against natural hazards is drastically reduced of a considerable percentage of the investigated stands (56 % of the stands < 100 a, 72 % of the stands > 100 a). In general it was evident that the protection capacity was positively linked to stand management. This means that the majority (87 %) of the not managed stands are assumed to be not able to ensure the protection function. On the other hand 51 % of the intensively managed stands were assessed as suitable for protection purposes. As expected the capacity for nature conservation was highest in the unmanaged stands and decreased with increasing stand management. The same was found for the capacity of recreation. However, most of the stands which were classified as advantageous regarding recreation and nature conservation have been opened by avalanches or local storms. In particular in these stands regeneration efforts are needed. Otherwise not only their low protection capacity but also their recreational value and their ability to provide different habitats will be decreasing drastically on the long run.