

Submitted Abstract

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Abstract

Ecosystem services (ESS) serve a wide range of human needs and can be divided into “provisioning” ESS (e.g., use of biomass such as wood), “regulating and maintaining” ESS (e.g., protection from avalanches and sequestration of carbon), and “cultural” ESS (e.g., recreational value, tourism, or biodiversity conservation). Valuation of ESS provides a comprehensive view on how human beings benefit from functional ecosystems. The focus of this project was to assess 17 ESS for the entire area of the Austrian Federal Forests Enterprise (ÖBf), which in total covers 10% of Austria’s national territory and 13% of the Austrian forests. The forest ecosystems of the Alpine Region are well represented by this survey.

For the impact analysis of different management scenarios, the six most relevant ESS were considered. In addition to determining the “status quo” representing the baseline assessment, the impacts of three management scenarios were examined. The main objective was to measure and evaluate the differences in environmental, spatial, and economic terms. In total, eighteen indicators were used to determine the impacts on ESS in the following scenarios: “Intensified Forestry,” “Ecology & Economy” and “Intensified Nature Conservation.”

For assessment, the following scientific methods were used: collection of spatial inventory data and benefit indicators; functional quantification of ecological services; deduction of the implicit valuation from market prices; collection of the costs of technical substitute measures (cost-based methods); analysis of travel costs and willingness-to-pay. Multiple data sources were used, most importantly the forest stand database on tree species, stand volumes, stand age, vertical structure and growth rates.

It was shown that local biodiversity conservation, recreation and tourism, protection from gravitational natural hazards, carbon storage, and timber production have the highest relevance for the comparison of the three management strategies.

The analyses show that five out of the six most relevant ESS have significantly higher values in the “Intensified Nature Conservation” scenario. Only the ESS timber productions has a negative correlation with this scenario.

The high benefits, particularly in the scenario “Intensified Nature Conservation,” illustrate that benefits derived from the conservation of biodiversity and the associated ESS are highly relevant in economic terms to societal welfare. The results also illustrate that, considering current and potential future trends, welfare benefits of conservation might increase further.