

> The value of recreation in the Swiss forest

Based on the data from WaMos 2 (final report)

*Summary of the publication «Wert der Erholung im Schweizer Wald»
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> Summary

The Swiss forest provides a wide variety of services for society today: in addition to wood production, protection against natural hazards and the provision of a habitat for animals, the forest is also a popular recreational space for the population. Hence, on top of its various other functions, the forest provides recreational opportunities which are availed of and valued by forest visitors. econcept was commissioned by the Federal Office for the Environment (FOEN) to estimate the monetary value of this service (recreational value of the Swiss forest). Based on the associated findings, determinants (influencing factors) of this recreational value were identified and analysed. For the identification of the determinants, the main focus was on identifying the extent to which the monetary recreational value is influenced by the forest characteristics experienced by forest visitors, the visitors' personal characteristics, and their motives and activities.

The empirical basis of the studies presented here was provided by the project WaMos2 Socio-Cultural Forest Monitoring (WaMos 2, Hunziker et al. 2012), which analysed the attitudes of the population to topics concerning forest and wood. Through the inclusion of corresponding questions, the comprehensive survey of over 3000 persons carried out as part of the WaMos 2 project enabled the estimation of the monetary recreational value of the Swiss forest and the investigation of the determinants of this recreational value.

Due to the lack of information about the forests visited, it was not possible to fully apply the travel cost method, which is frequently used for the monetisation of recreational services, in this study. For this reason, the so-called expenditure method, a simplified form of the travel cost method, was used. The basic idea behind the expenditure method is that the recreational benefit must be at least as great as the expenditure (travel costs, admission price, opportunity costs etc.) made by forest visitors when visiting a forest. The minimum value for the recreational benefit calculated in this way corresponds to the lower limit of the willingness to pay for the recreational service provided by the forest. Care should be taken in interpreting the aggregated value of the expenses. In particular the application in the context of cost-benefit analysis is not appropriate as the level of the "net utility" (utility derived from the forest visit minus the expenditure made for the forest visit) for the forest visitors remains unknown. For the same reason, it is not possible to directly extrapolate the monetary contribution that the population would be prepared to make for forest conservation from the results.

Monetary value of recreation in the Swiss forest

The value of recreation in the forest for each person could be calculated from the transport costs, travel time expenses and the travel time specified in the survey by individual forest visitors. On average this was CHF 9 per person per visit. The annual expenditure per visitor was then extrapolated by multiplying the frequency of visits by the recreational value in the forest per person and visit.

The frequency of visits was surveyed in WaMos 2 based on the categories: “almost daily”, “once/twice per week”, “once/twice per month”, “less than once per month” and “never”. Because scope for interpretation arises in the conversion of these response categories into numerical values, the response categories were converted into numerical values using three different codings. Through the application of the different codings to the frequency of visits, a range of CHF 290 and 589 per person and year was calculated for the recreational value of the forest. Based on the number of persons resident in Switzerland, this gives a total value of approximately CHF **1.9 to 3.9 per year** for the recreational value of the Swiss forest for the over-18 population.

The comparison of these results with those of the study by Ott and Baur (2005) based on WaMos 1 shows that the current estimation of the total value of recreation in the forest is around 14% lower than the value calculated by this study. This change in the recreational value of the forest over time can be explained by different and, in part, counteracting factors, for example: the average travel time is around 33% lower and the adapted time-cost rates are approximately 22% higher on average than in the 2005 study. Furthermore, the average travel costs have fallen by 47%, a fact that can be mainly explained by the far smaller proportion of people who travel to the forest by passenger car. In contrast, the average frequency of visits is 8% higher than in Ott und Baur’s (2005) study (with the same coding of the response categories). Moreover, the number of over-18 year-olds in the Swiss population¹ has increased by 12% as compared with the earlier study. The sum of these effects leads to the total change of 14%.

Determinants of the value of recreation in the forest

As part of the present study, the monetary value of recreation in the forest was calculated individually for each person surveyed by the WaMos 2 study using the expenditure method. Based on this, it was possible to examine the factors that influence (determinants) the value of recreation in the forest using a regression analysis.

To identify the relevant determinants of the value for recreation in the forest, based on the information provided by WaMos 2, a model with five groups of explanatory variables was established and estimated. The first group describes the socio-economic characteristics of the survey respondents. The second describes the characteristics of the residential area, for example the type of commune and the possibilities available for accessing the forest and green areas. With the third group, the attitudes of the people themselves are taken into account. The fourth group concerns the activities carried out in the forest and the motives for visits to the forest. Finally, the fifth group summarises the perceived forest characteristics. The first stage of the analysis involved the examination of the influence of each individual group and the second stage considered the influence of the individual variables in the groups. Using this process, it was possible to extrapolate an econometric model with just 17 variables without having to accept a relevant loss of variance explanation in comparison to the complete model.

The regression analysis that was carried out identified relevant factors that influence the value of recreation in the forest. The group “characteristics of location of resi-

¹ It was not possible to determine values for persons under 18 as they were not included in the surveys (WaMos 1 & 2).

dence” had the greatest impact on the variance. The groups “socio-economic characteristics”, “people’s attitudes”, “activities in and motives for visiting the forest” all explained an approximately equal proportion of the variance between the dependent variables. The contribution of the group “perceived forest characteristics” to the explanation of the variance was minimal. Nine out of the total 17 variables used are significant on the 1% level.

The study of the determinants of the monetary value of recreation in the forest carried out as part of this study is probably one of the first of its kind. It showed that the level of the monetary value of recreation in the forest for an individual is dependent on different factors. The proximity of the individual’s residential area to the forest, the possibility of substituting nearby green areas for the forest, and socio-economic and personal characteristics – for example age and origin (city/country) – appear to be the deciding factors here. It may be observed that the activities predominantly pursued by the person in the forest also plays a crucial role. Hence, activities that do not offer any clear possibilities for substitution, that is activities that can often only be carried out in the forest or can be pursued particularly well there (e. g. hunting, mushroom/berry picking, forestry work, dog walking), lead to significantly higher values for recreation in the forest. In the case of the perceived characteristics of the forest (e. g. varied, unspoilt, dark, with deciduous trees, with coniferous trees, available infrastructure), only the scope of the perceived infrastructure has a significant influence on the recreational value.

The analysis carried out here was able to identify relevant impact factors for the recreational value of the forest. Beyond this, it also emerged clearly, however, which variables do not contribute to the explanation of the variables and cannot, therefore, be included with the influencing factors. For example, the different types of commune cannot be identified as influencing factors. The perceived forest characteristics (with the exception of infrastructure) have equally little influence on the value of forest recreation. Even if the Swiss forests differ very strongly in terms of their characteristics, it is not possible to identify particular types of forests that generate a particularly high value.

The main findings of this study were published in the specialist Swiss forestry journal *Schweizerische Zeitschrift für Forstwesen* and have been made accessible in this way to a specialist audience (von Grünigen and Montanari 2014).