

Towards standards for quantification of recreational use in forest areas – indicators and data collection tools applied by the State Forests National Forest Holding, Poland

Karolina Taczanowska, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria

E-mail: karolina.taczanowska@boku.ac.at

Barbara Latosińska, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria

Christina Czachs, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria

Joanna Hibner, Jagiellonian University, Cracow, Poland

Andreas Muhar, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria

Christiane Brandenburg, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria

Maria Rothert, State Forests, Warsaw, Poland.

The social functions of forests are becoming increasingly recognized as being very important for the society. A balanced multi-functional forest management is necessary to maintain its key functions, such as timber production, nature conservation and provisioning of recreational space (Pröbstl et al., 2010). In order to successfully manage forest areas and to gain realistic view on actual visitation levels and use of tourist infrastructure, it is necessary to find reliable and effective tools and methods for visitor data collection and data analysis (Arnberger, A., Brandenburg, C., Muhar, A., 2002). From the management perspective definition of indicators and standard tools that could assist management of tourism and recreation in the forests is particularly important (Fredman, 2014; Sievänen et al, 2014; Sievänen et al, 2008; Rauhala, et al., 2002; Eco-Counter, 2018)

The objective of the study was to create the list of indicators and to define reliable tools that can be utilized for measuring recreation use. The main focus was placed at systematic quantification of visitor loads at recreational trails.

The concept of indicators was supported by empirical data collected during a pilot study in two forest areas: Tricity Landscape Park and Koziencice Landscape Park, located in Poland. Visitor monitoring campaigns encompassing 1-year period have been carried out in each study area in 2015 and 2016. Combination of the following data collection methods has been applied: automatic counting (Eco-Counter: PYRMT2) and manual counting of visitors; on-site interviews (PAPI); on-line interviews (CAWI); trip diaries (paper map sketches) and GPS-tracking.

List of indicators of recreational use and suggested data collection methods has been presented in Table 1. Total sums of recreationists visiting specific forest, normalized by area [ha] is an important indicator at a regional level. However, it requires additional standardized methods of measurements extrapolation to the area level.

Practical experience gained during the field work in two pilot areas was crucial for developing data collection standards and indicators describing recreational use that is being applied in various management contexts, such as general communication and public relations (underlying the social function of forests), allocation of recreational infrastructure and provisioning visitor information, planning logging (timber production), justification of budget allocation. Presented standards have been disseminated among the 430 forest units governed by the State Forests in Poland and are the first step in the ongoing discussion concerning standardized quantification of recreational use and systematic monitoring of social forest functions.

Table 1. Indicators of recreational use and suitable data collection methods.

Nr	Indicator	Location	Data Collection Method
1	Annual sum of visits	Specified trail segment	Automatic counting
2	Share of visits in annual sum - per month [%]	Specified trail segment	Automatic counting
3	Share of visits in annual sum - per day [%]	Specified trail segment	Automatic counting
4	Share of visits in annual sum - per hour – during weekdays, excluding bank holidays [%]	Specified trail segment	Automatic counting
5	Share of visits in annual sum - per hour – during weekends & bank holidays [%]	Specified trail segment	Automatic counting
6	Daily sum [top 3 peak days]	Specified trail segment	Automatic counting
7	Daily average	Specified trail segment	Automatic counting
8	Daily average during weekdays [excluding bank holidays]	Specified trail segment	Automatic counting
9	Daily average during weekends & bank holidays	Specified trail segment	Automatic counting
10	Hourly sum [top 3 peak hours]	Specified trail segment	Automatic counting
11	Share of visits by recreational activity [walking, cycling, jogging, Nordic Walking, other]	Based on standardized observations at key entrance points in the study area	Manual counting
12	Share of visits by gender [male, female]	Based on standardized observations at key entrance points in the study area	Manual counting
13	Satisfaction with recreational visit to the forest [Likert scale]	Representative sample at key entrance points in the study area	On-site interview (PAPI)
14	Annual sum of visits / ha	Entire study area	Automatic counting and statistical modelling
15	Daily sum of visits / ha [top 3 peak days]	Entire study area	Automatic counting and statistical modelling
16	Daily sum of visits / ha [average]	Entire study area	Automatic counting and statistical modelling

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