



Valuing recreational ecosystem service flow in Finland



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ABSTRACT

In this study we defined the spatial allocation for the value of recreation ecosystem services in Finland. The Finnish National Outdoor Recreation Demand Inventory, a representative survey dataset of Finnish recreationists and their recreation visits (last close-to-home visit and overnight nature trip), allowed us to estimate the annual number of recreation trips to various area types: (1) areas used under everyman's right, (2) state-owned recreation and nature conservation areas, and (3) leisure homes and their surroundings. To match the values for recreation visits with each area type in different parts of Finland, we applied the aggregate travel cost method. GIS was used to map the regional visits as well as their value. The results emphasize the relative importance of close-to-home recreation compared to overnight nature trips in terms of the total number of visits and their values. The spatial allocation of the value of close-to-home visits followed population density, while the type of ecosystem had a minor role. Our approach provides an example of how to utilize national recreation data, which are also available in some other European countries, to define and map the value of recreational ecosystem services. This information is becoming increasingly important for land use decisions as well as for national debates about the health benefits of outdoor recreation.

MANAGEMENT IMPLICATIONS

This study documents the considerable value associated with the recreational use of ecosystems and how it can be used for natural resources policy and management. The analysis presented in this paper shows how a high quality recreational data set allows analysts

- To discuss the value of recreational use in the context of other forms of land uses;
 - To use the information for national strategic recreational management as well as for national health strategies;
 - To integrate cultural ecosystem services in the spatial development of specific sites;
 - To use the information in environmental assessments, at least on a strategic level; and
- To discuss the quality of life on a regional basis.

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1. Introduction

The concept of ecosystem services identifies the benefits accruing to humans from nature (Millennium Ecosystem Assessment (MA), 2005). Since the first categorization of ecosystem services in the MA, several other categorizations have appeared. The recently published Common International Classification of Ecosystem Goods and Services (European Environment Agency, 2013) groups ecosystem services under three themes: provisioning, regulation and

maintenance, and cultural services. Recreation benefits belong to cultural services, implying that ecosystems provide nonmaterial benefits for people. Including recreation and ecotourism in ecosystem services aims at recognizing that people often choose where to spend their leisure time partly based on the characteristics of the natural or cultivated landscapes in a particular area (Millennium Ecosystem Assessment (MA), 2005; Gee & Burkhard, 2010). Therefore, analysis of the benefits of cultural ecosystem services must consider the ecosystem as much as the relationship between the individual and the environment, including personal and social driving forces that influence the demand side (Gee & Burkhard, 2010).

Fisher, Turner and Morling (2009) suggested that ecosystem services are those aspects of ecosystems utilized (actively or

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passively) to produce human well-being. Current research findings also underline the additional health benefits from outdoor recreation activities in natural environments (e.g. Li, 2012; Pietilä, 2014; Von Lindern, 2014). Recreation and health benefits jointly result from the recreational environment provided by different ecosystems, inter alia forests, meadows, or a vista, together with multiple inputs such as human, social, and built capital, including conventional goods and services, e.g. equipment, time allocation and access (Boyd & Banzhaf, 2007). The economic value of ecosystem services refers to the value of the benefits an individual obtains from consuming the services provided by an ecosystem, including use (e.g. recreation) and non-use values (e.g. existence value). In the case of recreation, the share of the economic value accounted for by the ecosystem may not be easily identified. Partly for this reason, the focus of past studies has been on the value of recreation visits. The present study also focused on the use value produced by recreation visits typically spread over a wide range of ecosystems (e.g. forests, agricultural land, coastal areas). However, we aimed to define the role of human inputs and ecosystems.

Previous attempts to map cultural ecosystem services (Norton, Inwood, Crowe, & Baker, 2012), and recreation services in particular (Jones, Wright, Bateman, & Schaafsma, 2010; Sen et al. 2011; Vihervaara, Kumpula, Ruokolainen, Tanskanen, & Burkhard, 2012), can be found in the literature. This mapping has been based on ecosystem characteristics, on the level of use, or on the economic value of the use. Moreover, the scale of analysis has been national as well as local (Phaneuf, Smith, Palmquist, & Pope, 2008; Hein, van Koppen, de Groot, & van Ierland, 2006) or site specific (Baerenklau, Conzález-Cabán, Paez, & Chavez 2010), depending on the context. Here, we were interested in national-scale mapping of the value of recreation benefits. A national approach allows transferability of the value estimates (Jones et al., 2010), offering an alternative approach to the meta-analysis of separate site-specific studies in transferring monetary values. This method may also support the information needs of national environmental accounting, which serves as a measure for well-being arising from environmental goods and services, in a manner similar to the way traditional national accounts reflect the market economy. In such accounting, an assessment is needed of the current flow of the ecosystem services, i.e. the current state of the services that people actually utilize (Boyd & Banzhaf, 2007). The shortage of non-market values for natural environments has often prevented their inclusion in accounting and the development of environmental accounting in general (e.g. Goio, Gios, & Pollini, 2008).

In a previous analysis of recreation ecosystem services on a national scale, Norton et al. (2012) suggested a resource-based approach in which ecosystems are qualitatively evaluated as producers of cultural services. In Great Britain, Jones et al. (2010) aggregated site-based recreation surveys following the travel cost method. However, site-specific approaches do not fit the context of open public access in Nordic countries, because when all natural areas are open for public recreation, the collection of site-specific use information is impossible. As an alternative, we developed an approach based on population-based data from a national inventory of the recreational use of natural areas and urban green spaces. This method is also of interest to other European countries with national inventories of outdoor recreation (Sievänen et al., 2008), and can provide an information base for the analysis of recreation as a component of cultural ecosystem services.

The objective of this study was to define the spatial distribution of recreation visits in Finland and the non-market value of these visits. We focused on the recreation value produced by Finnish households utilizing national ecosystems. Furthermore, we discuss the role of ecosystem services and their institutional provision as a component of this value. The ultimate objective of our study was to test the applicability of national recreation inventory data for

mapping recreation value and for generating value estimates that can be used in various decision-making situations in Finland.

The study was based on data from the second Finnish National Outdoor Recreation Demand Inventory (LVVI2) (Sievänen & Neuvonen, 2011), which enabled us to derive regional estimates of the annual number of recreation visits. These were categorized into close-to-home visits and overnight nature trips. Furthermore, various area types were examined in the analysis, which were as comparable as possible with the spatial area types. These were: (1) areas used for recreation based on everyman's right, regardless of who owns the land (including municipal recreation areas); (2) state-owned recreation and nature conservation areas such as national parks; and (3) leisure homes and their surroundings. For the valuation of recreation visits, we applied the travel cost method, which is a widely used revealed preference method for valuing recreation benefits, i.e. it is based on actual behavior.

This paper is divided into six parts, including this introductory chapter. Next a brief overview is provided of outdoor recreation settings in Finland, in terms of both the supply of recreation areas and the demand for recreation opportunities. The methods are described in Section 3, and the results are presented in Section 4. Section 5 discusses the findings and Section 6 presents concluding remarks.

2. Supply of and demand for recreation services in Finland

Outdoor recreation in Finland is characterized by 'everyman's right', the traditional free right of access to land and waterways, who owns the land (Finnish Ministry of the Environment, 2013). Everyman's right basically covers walking, skiing, and cycling freely in the countryside, as well as temporary camping, gathering wild foods and flowers, fishing with a rod and line, and using water areas for boating and swimming. Free access is closed to a few areas only, such as strict nature reserves and military areas used by the Finnish Defense Forces.

In addition to everyman's right, some areas contain special provisions for recreation by offering recreational facilities such as hiking trails, ski tracks, camping sites, and cooking shelters, among others. In the seven hiking areas, commercial forestry is limited, and both nature conservation and outdoor recreation are explicit management goals. Many areas also offer a visitor center, a tourist center, or rental cabins. The 37 national parks are characterized by their diverse and unique natural features. Their primary purpose is to protect the original biotic and abiotic features of the natural environment, including heritage landscapes (Metsähallitus, 1999). At the same time, the management principles of national parks emphasize the importance of creating opportunities for recreation, hiking, and experiencing nature, leading to a wide variety of recreational facilities. Both hiking areas and protected areas on state land are mainly located in northernmost Finland, with a few scattered and small areas in southern and central Finland.

Beyond these recreation services open to everyone, every seventh Finnish household owns a leisure home (Official Statistics of Finland (OSF), 2012). These are typically used by the owner's family and adult children, or by siblings with their families. In this way, about 40% of the Finnish population has the opportunity to spend time in a recreational home on a regular basis. Two-thirds of these homes are located in the same province as the primary residence of the owner, and one-third are actually in the same municipality. A typical, but not the only possible location for a leisure home is by a lake or the sea, and leisure homes are consequently concentrated along the south coast and in the lake district of central and eastern Finland.

According to the LVVI2 the ecosystems used for recreation vary between recreational area types. The average distance to a forest is

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