Mapping outdoor recreation benefits in Finland using national inventory data

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Introduction

Ecosystem services are the benefits people obtain from ecosystems (Millenium ecosystem assessment 2005). They have been categorized as provisioning services, regulating services, cultural services and supporting services. Recreation benefits considered in this study belong to cultural services that are nonmaterial benefits people obtain from ecosystems. Total economic value of ecosystem refers to benefits an individual obtains from consuming services provided by an ecosystem. Recreation value discussed here are direct, non-consumptive use values produced in interaction of individual and ecosystems. In this study we analyze the spatial allocation of the recreation ecosystem services by mapping both recreation visits and their values on national scale in Finland. The value of a recreation visit is defined with an application of travel cost method.

Methods

The study is based on second Finnish national recreation inventory data, LVVI2 (Sievänen & Neuvonen 2011). The data set contains a representative survey data of Finnish recreationists and their recreation visits (last close to home visit and over nigh nature trip). The data allowed us to have estimates of the annual number of recreation trips to various area types. In the analysis the area types used were as comparable as possible with the area types in GIS data sources. The area types were 1) recreation areas together with other green spaces that are used for recreation based on everyman's right e.g. private-owned forests 2) state owned recreation and nature conservation areas such as national parks 3) vacation homes and their surroundings. The recreational use to various area types was mapped on regional scale.

To obtain the values of recreation visits to each area types we used aggregate travel cost method (e.g. Vesterinen et al. 2010, Pouta & Ovaskainen 2006). Contrary to traditional travel cost models focusing on a specific site, we modeled the demand for trips to a representative site, i.e. we aggregated the destinations individuals visited most recently into the same travel cost model. We estimate the demand function for trips to each area type. The estimated demand functions provided us information to estimate the value estimate i.e. the consumer surplus of a trip to each area type. The annual recreation benefits on each region (nuts3) were calculated by estimating the average number of trips at the population level and multiplying it with estimated benefits per predicted trip. The value information was mapped on regional level.

Results

The results of the number of visits and the aggregate values of visits and trips clearly show the importance of close-to-home recreation. The relative importance of close-to-home recreation is high compared to nature trips with overnight stay in total number of visits and values. The spatial allocation of close-to-home visits and values follow the location of population. The results of the number of use show the importance of green areas in most populated parts of the country. While the close-to-home recreation visits were further divided to area types, the importance of everyman's right is emphasized. The clear majority of the daily visits and their values distributed to areas that are used based on the everyman's right. The recreational use of nature, based on everyman's right, was emphasized also because the state areas provided for recreation and nature conservation are mostly located in northern Finland on sparsely populated areas far away from the population centers of southern Finland.

In nature trips the most resource rich areas in northern Finland, particularly Lapland was emphasized in number of trips as well as in values. The areas used based on everyman's right were the most important destinations. However, particularly in the middle and eastern part of the country and on the south-west coastal regions the high total number of the trips to summer cottages was considerable. In the northern part of the country the areas important because of their high quality recreation resources, i.e. state areas such as national parks, received about one third of the number of trips.

Conclusions

The national recreation inventory data that included a representative sample of Finnish 15-74-year-old population allowed us to map the recreational ecosystem services in terms of recreational use of nature and to apply travel cost method pooling sites to estimate welfare effects. Although, the sample size was high on national level the regional sub-samples did not allow estimations for all area types on all the regions. Still as national recreation inventory data sets exist from few European countries, our approach may provide an example how to utilize the national recreation data to evaluate the fruition of recreational ecosystem services. European wide recreation inventory with location information would provide a versatile database for analysis of recreation as an ecosystem service.
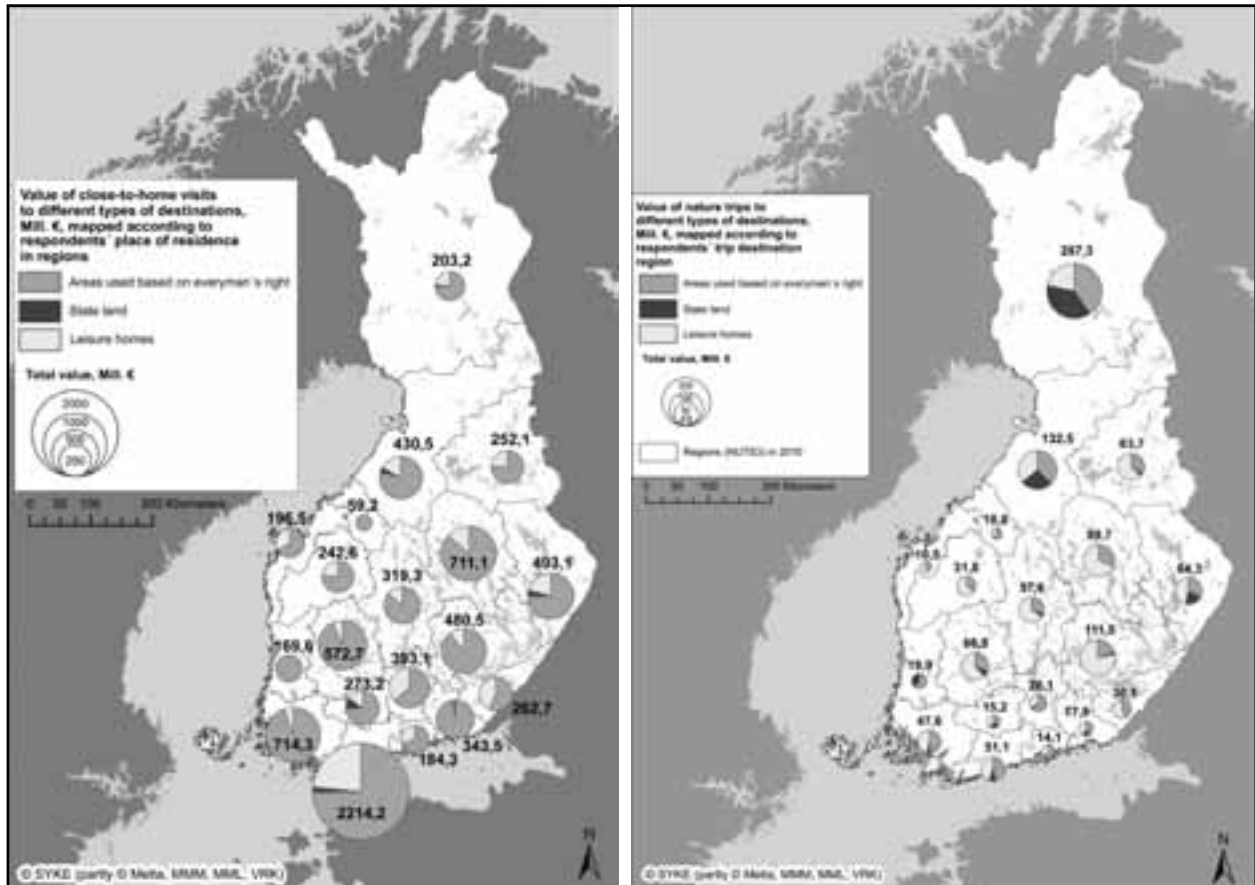
Figure 1. The value of close-to-home recreation visits and nature trips by destination types.

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