



Mapping cultural ecosystem services: A framework to assess the potential for outdoor recreation across the EU



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ABSTRACT

Research on ecosystem services mapping and valuing has increased significantly in recent years. However, compared to provisioning and regulating services, cultural ecosystem services have not yet been fully integrated into operational frameworks. One reason for this is that transdisciplinarity is required to address the issue, since by definition cultural services (encompassing physical, intellectual, spiritual interactions with biota) need to be analysed from multiple perspectives (i.e. ecological, social, behavioural). A second reason is the lack of data for large-scale assessments, as detailed surveys are a main source of information. Among cultural ecosystem services, assessment of outdoor recreation can be based on a large pool of literature developed mostly in social and medical science, and landscape and ecology studies. This paper presents a methodology to include recreation in the conceptual framework for EU wide ecosystem assessments (Maes et al., 2013), which couples existing approaches for recreation management at country level with behavioural data derived from surveys and population distribution data. The proposed framework is based on three components: the ecosystem function (recreation potential), the adaptation of the Recreation Opportunity Spectrum framework to characterise the ecosystem service and the distribution of potential demand in the EU. Results show that 38% of the EU is characterised by a high outdoor recreation potential, which is easily accessible, and that such areas can host about 35.4% of potential demand for close-to-home trips (<8 km). This proportion increases to 37.6% for long distance travelling (<80 km). The analysis framework can be applied to quantify the availability of outdoor recreation potential as an ecosystem service to EU citizens, to describe through country profiles differences in ecosystem service provision at regional level, and can be used as an input to land use planning processes.

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1. Introduction

The MA, 2005 and The Economics of Ecosystems and Biodiversity initiative (TEEB, 2010) have greatly contributed to the introduction of the ecosystem service concept in multiple

policies and initiatives at global and European level. Examples include the Aichi Targets of the Convention on Biological Diversity, the EU Biodiversity Strategy to 2020, and the EU Blueprint to safeguard Europe's Waters. This has created the need to operationalise the concept, both in terms of geographical mapping and economic valuation, so that ecosystem services can be effectively incorporated into policy-making. Many initiatives are supporting the difficult path to an effective and harmonised use of the ecosystem service concept, as a key step towards resource efficiency as a common goal of the above mentioned policy actions (EC, 2011).

Among the main ecosystem services groups identified by the (MA, 2005) and CiCES (Maes et al., 2013; Haines-Young and Potschin, 2013) cultural ecosystem services are those that due to

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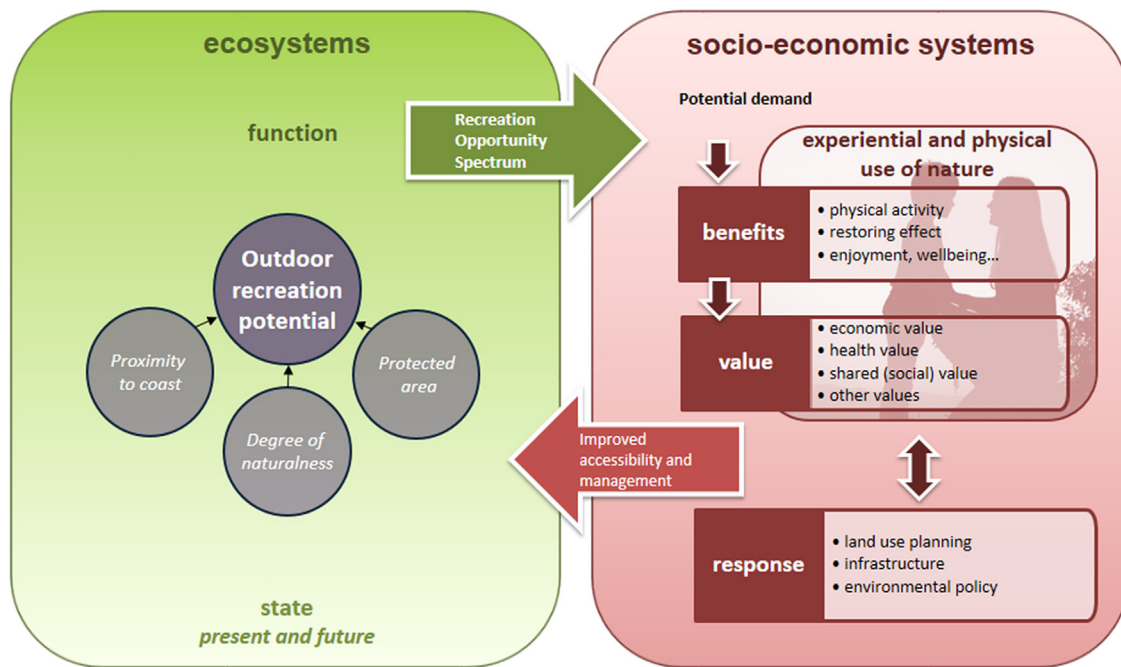


Fig. 1. Conceptual framework for EU wide assessment of outdoor recreation as ecosystem service.

Adapted from Maes et al. (2013).

their intangible nature and dependence from social constructs are particularly challenging to map and assess (Daniel et al., 2012).

Cultural ecosystem services are defined as “non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experience” (MA, 2003, Chapter 2, p. 58). Examples of cultural ecosystem services are: appreciation of natural scenery; opportunities for tourism and recreational activities; inspiration for culture, art and design; sense of place and belonging; spiritual and religious inspiration; education and science (De Groot et al., 2010).

The work presented in this paper aims to provide a framework for addressing outdoor recreation as an example of cultural ecosystem services, and it is part of a larger effort to set up tools and methods for the spatially explicit evaluation of ecosystem services in support of the Biodiversity Strategy 2020 (Maes et al., 2011a). Therefore, a model is developed, to assess the availability of outdoor recreation potential to citizens, at the continental scale. Outdoor recreation was selected due to its importance for millions of people and because it is a service for which the geographical distribution of ecosystems is particularly important. More specifically, the type of recreation addressed in the paper concerns outdoor activities generating benefits in daily life (day leisure visits), spanning from having a walk in the closest green urban area, to a short bike ride in a local natural park, to a day trip with the sole purpose to experience nature. Long distance (>100 km) travelling is not included in the exercise as the presented analysis focuses on resident population and day trips.

The proposed methodology is based on three components:

- the modelling of the ecosystem function, through a recreation potential index;
- the characterisation of the ecosystem service through the Recreation Opportunity Spectrum;
- an assessment of potential demand.

In combination these components are used to evaluate the extent to which European citizens can benefit from ecosystems through recreation.

2. Material and methods

2.1. Characterising outdoor recreation as an ecosystem service

Outdoor recreation is addressed in this paper from the perspective of ecosystem services; therefore, we include all ecosystem types in the analysis, irrespective of intensity of use and alteration by humans, including natural, semi-natural and more intensively managed ecosystems. All ecosystems are considered to be potential providers of the recreation service, irrespective from their conservation status, though the range of provision changes according to ecosystem characteristics.

The conceptual framework linking ecosystems to the socio-economic system is presented in Fig. 1, and describes from where and with which intensity the flow of the services originates, and how benefits reach people generating wellbeing. Recreation as an ecosystem service is classified by Costanza (2008) as “User movement related”, since the delivery of the service strictly depends on the presence of people in the ecosystems. Accessibility is, therefore, a main component of this modelling exercise. It is, in fact, necessary that people reach sites in order to benefit from this ecosystem service.

In the case of outdoor recreation, three main components characterise the flow of the benefit:

- the ecosystem function, which is provided in principle by all ecosystems, with a provisioning intensity that ranges from “low” to “high” in relation to identified ecosystem characteristics.
- accessibility: in order to let the ecosystem service flow happen, people must be able to reach recreation sites, and infrastructures are needed to make the sites accessible.
- potential demand and its spatial distribution.

In order to map outdoor recreation as an ecosystem service, it is necessary to know the main features that characterise the behaviour of people when they recreate. This concerns for instance the type of preferred habitats, the travelled distance and the presence of attractive features (e.g. trails, bird-watching towers).

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