



Cultural ecosystem services in the UK: Lessons on designing indicators to inform management and policy



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ABSTRACT

We explore the degree to which a useful and cost-effective set of cultural ecosystem services (CES) indicators can be produced at different spatial scales in the UK, using readily available data. We place this within the conceptual framework developed for the understanding of CES produced by the recent UK National Ecosystem Assessment (UK NEA) and its Follow-on.

We examine a set of ‘supply-side’ stock indicators, involving the calculation of the percentage cover of *environmental places* such as woodlands, country parks and private gardens. Although stock indicators can be used to measure the potential of different localities to deliver CES, the accessibility of these environmental places to local populations also needs to be understood. We illustrate this with indicators based on access to four types of environmental space: ancient woodland, country parks, nature reserves and areas with natural cover. We illustrate how both the stock- and access-based indicators could be used to benchmark Local Authority Districts (LADs) across the whole of the UK.

We explore how a range of indicators can be developed from readily available information to compare the quality of environmental places at a more local level, using The City of Nottingham LAD as an example. We also examine the potential to use a household survey, the UK Monitor of Engagement with the Natural Environment (MENE), to estimate demand for certain types of *cultural practice* and environmental place, and to use relationships revealed in this information to estimate the degree to which supply and demand for these practices and places match one another.

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1. Introduction

Within the spectrum of ecosystem services, it has proved particularly difficult to create practical, cost effective indicators for cultural ecosystem services (CES) (Hernández-Morcillo et al., 2013). This partly reflects the characterisation of CES as an intangible and interpretative realm of ecosystem assessment and raises significant challenges for a field where the quantitative measurement of ecosystem services is considered central to their visibility within decision making. In this study we take a fresh look at the problem of creating indicators for CES, arguing that simple measures can be

created from publicly available data that can help managers and decision makers to take CES into account.

1.1. Cultural ecosystem indicators: the need to measure services, not benefits

CES were described by the Millennium Assessment as ‘the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience’ (MA, 2005). This definition has been criticised as it conflates services with the benefits they provide (Chan et al. (2011, 2012)). One consequence of this is that cultural ecosystem services tend to be viewed as an intangible realm where applications of quantitative methods appear inappropriate or highly context-specific. In the UK National Ecosystem Assessment (NEA) and its Follow-on (NEAFO) a distinction is made between the benefits provided by CES and the *environmental spaces* and the *cultural practices* undertaken within them which enable their delivery

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(Church et al., 2011, 2014). Although 'recreation', for example, had often been identified as a 'cultural ecosystem service' in studies that followed the MA, it was argued that it, together with spiritual, aesthetic and educational outcomes, is best regarded as a benefit or 'cultural good'. It was proposed that we might more usefully think of the bio-physical spaces in which these cultural benefits were obtained as representing 'final' cultural ecosystem services. A similar argument has been made in the development of the Common International Classification of Ecosystem Services (CICES) (Haines-Young and Potschin, 2013). The NEA conceptual framework thus envisages that cultural ecosystem services are delivered through 'environmental settings' or 'environmental spaces', that can be recognised by the range of cultural practices that take place within them. No strict typology has been derived for environmental spaces, but they include areas distinguished by natural or semi-natural vegetation, such as woods or moorland, as well as areas specifically designed for outdoor recreation, such as city and country parks, and recreation grounds, and areas designed for other purposes but which may also deliver CES, such as fields, canal tow paths, allotments and cemeteries. Cultural practices are the activities in which people engage in environmental spaces. These practices range from such things as going for a walk, meeting friends, watching wildlife and tending an allotment, and a variety of different cultural practices that may participated in by visitors within the same environmental place.

During the UK NEA Follow-on, this conceptual framework has been further refined by considering in detail the role of cultural values and the specific benefits provided when environmental spaces, cultural practices and cultural values come together. Environmental spaces are essentially distinct geographical entities, referred to as *settings* in the earlier NEA, that are distinguished by their potential to deliver CES. They both enable, and are in turn shaped by, cultural practices, which may be physical (embodied), textual (mediated) and/or linguistic (discursive) in form. Again, cultural practices reflect and constitute cultural values and are a discernible way that culture can be said to manifest itself, both at particular moments in time (e.g. through recreational activity) and as part of a broad cultural realm of lived experience (e.g. through expression of a whole 'way of life') (Williams, 1983).

The distinction between services and benefits is helpful for the development of CES indicators, as it suggests that measurement of the availability and quality of the natural environment, and the measurement of what is undertaken in it, can form the basis for measuring CES. This is arguably easier to achieve than directly measuring benefits, which are often intangible and hard to quantify.

1.2. Review of existing indicator research

The nature of the problem is illustrated by the fact that relatively little has been done to develop robust indicators for CES. In a review, Hernández-Morcillo et al. (2013) found only 38 of 344 indicators in the MA corresponded to cultural services, and noted that Rey Benayas et al. (2009) did not find a single study which measured cultural ecosystem services explicitly, within a meta-analysis of 524 indicators of biodiversity and ecosystem services from 89 restoration assessments. In total Hernández-Morcillo et al. (2013) were able to examine 70 CES indicators, of which 54% were for recreation and ecotourism. Only 23% of the studies used spatially explicit information. CES indicators have most often been restricted to capturing visitor rates at specific sites as measures of demand (Plieninger et al., 2013) and do not, therefore, provide a basis for comparisons or benchmarking between locations. Studies undertaken for the Secretariat of the Convention on Biological Diversity noted that indicators of ecosystem services often focussed on purely provisioning services and often studies only used recreation and tourism as a measure of CES (UNEP-WCMC, 2011).

Where spatial quantitative assessments have been made, these have mainly been in the form of in-depth consultative studies with local communities (see, for example, Balram and Dragičević (2005), Brown and Raymond (2007), Bieling and Plieninger (2013), Plieninger et al. (2013)). Such localised studies are based on an understanding that CES are only intelligible in terms of an interaction between the natural environment and the cultural history and individual beliefs, preferences and values of a local population, and that there is a lack of knowledge of the way in which environmental spaces and the cultural practices which can be conducted in them affect benefit in a local context, and by what criteria the quality of different locations should be judged locally. For example, Jorgensen and Anthopoulos (2007) found that for elderly age groups the degree to which they felt safe, as well as appreciation of links with the past and immersion in nature, may be relatively more important determinants of whether these groups enjoyed visiting urban woodlands, when compared with younger age groups. The same agricultural landscape may mean different things to those who have farmed it for generations compared to those who are enjoying it for its associations with a famous author.

Measuring CES is therefore not as straightforward as it often is for other ecosystem services, where there is often a clearer relationship between the quality of services provided and a measurable entity, such as amount of carbon sequestered by the trees in forest, or the number of species the same forest supports. The CES offered by a forest depend not only on the physical characteristics of the forest, but also on the importance it has for the local human population, how many people visit it, what they do there and the values they bring to the experience. Furthermore, because people enjoying CES often do so as part of a journey, it is difficult to ascribe specific benefits to specific locations or indeed to define these locations – a typical rural walk, for example, may take in a variety of habitats and environmental features, some of which are walked over or within, and others which are observed from afar.

In addition to the difficulty of adequately measuring such complex relationships in the local context, the benefits deriving from CES themselves have been divided into a number of different elements by the MA, which have been broadly accepted elsewhere: Spiritual and Religious, Recreation and Tourism, Aesthetic, Inspirational, Sense of Place, Cultural Heritage, Education (MA (2005), Hernández-Morcillo et al. (2013), Bieling and Plieninger (2013), Chan et al. (2011)). In practice, it is extremely difficult to disentangle these strands from one another as a single interaction with nature might involve aspects of all of them (Church et al., 2011).

In the face of such challenges, one approach might be to restrict attempts to measure CES to fine-scale localised studies where research resources were available to conduct in-depth investigations. Different policy and management initiatives are likely to wish to create their own indicators to answer the specific questions that face them, and it may therefore be better to restrict the creation of indicators for CES to ad hoc cases where the resources are available to derive a set of indicators to address the information needs of a specific programme or local initiative. However, there is a risk that complex localised measures of CES produced in this manner may fail to match criteria identified as important for an environmental indicator, such as the promotion of simplification and quantification, the need to be readily understandable, to use information that is readily available, to be cost-effective, be quick to produce, and able to facilitate comparisons between different geographical areas (Environmental Challenge Group (1995), Andersen (1991), CSIRO (1998), Audit Commission (2005)).

Another approach would be to acknowledge that, given the current state of our knowledge and the resources available for research, the measurement of CES would inevitably be imprecise, but that we should investigate whether cost effective indicators, using currently available data, could be produced which may at least partly

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