



# A pathway to identifying and valuing cultural ecosystem services: An application to marine food webs



Corinne Baulcomb<sup>a,\*</sup>, Ruth Fletcher<sup>a,1</sup>, Amy Lewis<sup>a,2</sup>, Ekin Akoglu<sup>b</sup>, Leonie Robinson<sup>c</sup>,  
Amanda von Almen<sup>a,3</sup>, Salman Hussain<sup>a,\*,4</sup>, Klaus Glenk<sup>a,\*,5</sup>

<sup>a</sup> Sustainable Ecosystems Team, Land Economy, Environment & Society Research Group, Scotland's Rural College, Peter Wilson Building, King's Buildings, West Mains Road, Edinburgh EH9 3JG, United Kingdom

<sup>b</sup> Institute of Marine Sciences—Middle East Technical University, PO Box 28, 33731 Erdemli-Mersin, Turkey

<sup>c</sup> University of Liverpool, School of Environmental Science, Liverpool L69 7GP, United Kingdom

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## ABSTRACT

Beyond recreation, little attention has been paid thus far to economically value Cultural Ecosystem Services (CESs), especially in the context of coastal or marine environment. This paper develops and tests a pathway to the identification and economic valuation of CESs. The pathway enables researchers to make more explicit, and to economically value, cultural dimensions of environmental change. We suggest that the valuation process includes a simultaneous development of the scenarios of environmental change including related biophysical impacts, and a documentation of culture–environment linkages. A well-defined ecosystem service typology is also needed to classify cultural–ecological linkages as specific CESs. The pathway then involves the development of detailed, multidimensional depictions of the culture–environment linkages for use in a stated preference survey. The anticipated CES interpretations should be confirmed through debriefing questions in the survey questionnaire. The proposed approach is demonstrated with a choice experiment-based case study in Turkey that focuses improvements to the food web of the Black Sea. The results of this study indicate that economic preferences for CESs other than recreation can be estimated in a way that is economically consistent using the proposed approach.

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## 1. Introduction

The need for improved decision-making and for ecological improvements in the context of marine ecosystems has been formalized within the last decade in a number of places around the world

(ACF and NELA, 2006; S.2327, 2000), including in Europe with the Marine Strategy Framework Directive (MSFD) (European Commission, 2008). The MSFD mandates not only that the state of Europe's regional seas be improved, but also that an ecosystem service<sup>5</sup> approach is adopted to evaluate the (economic and non-economic) impacts associated with the implementation of environmental policies.

There is one category of marine ecosystem service, however, that remains relatively neglected in the non-market valuation literature: cultural ecosystem services (CESs) (Böhnke-Henrichs et al., 2013; Rodriguez et al., 2006; Schaich et al., 2010). Cultural ecosystem services are those ecosystem services that contribute to human well-being because of the existence of a particular interpretive 'lens' (or perspective) that has its roots in one's cultural background. This distinguishes them from other ESs, the provision of which that can

\* Corresponding author. Tel.: +44 131 535 4031.

\*\* Co-corresponding authors.

E-mail addresses: [Corinne.Baulcomb@sruc.ac.uk](mailto:Corinne.Baulcomb@sruc.ac.uk) (C. Baulcomb),

[Ruth.Fletcher@unep-wcmc.org](mailto:Ruth.Fletcher@unep-wcmc.org) (R. Fletcher),

[Amy.Lewis@wildeconomics.org](mailto:Amy.Lewis@wildeconomics.org) (A. Lewis), [Eakoglu@ogs.trieste.it](mailto:Eakoglu@ogs.trieste.it) (E. Akoglu),

[Leonie.Robinson@liverpool.ac.uk](mailto:Leonie.Robinson@liverpool.ac.uk) (L. Robinson),

[Amanda.vonalmen@gmail.com](mailto:Amanda.vonalmen@gmail.com) (A. von Almen),

[Salman.Hussain@UNEP.org](mailto:Salman.Hussain@UNEP.org) (S. Hussain), [Klaus.Glenk@sruc.ac.uk](mailto:Klaus.Glenk@sruc.ac.uk) (K. Glenk).

<sup>1</sup> Present Address: Programme Officer, Business Biodiversity and Ecosystem Services, World Conservation Monitoring Centre, 219 Huntingdon Road, Cambridge CB3 0DL, UK.

<sup>2</sup> Present address: Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Borgo Grotta Gigante 42/C-34010 Sgonico, TS, Italy.

<sup>3</sup> Present address: Sustainability/Energy Efficiency Analyst at LORD Green Real Estate Strategies. 6440N. Central Expressway, Suite 703, Dallas, TX 75206, USA.

<sup>4</sup> Present address: 11-13 Chemin des Anémones, 1219 Châtelineau, Geneva, Switzerland.

<sup>5</sup> In the context of this study, we utilise the following definition of ecosystem service: "ecosystem services are the direct and indirect contributions of ecosystems to human well-being" (Böhnke-Henrichs et al., 2013). Readers should note that 'direct' and 'indirect' in this definition relate to whether services are realised without or with other forms of capital, respectively, and do not relate to 'final' and 'intermediate' services.

always be objectively measured without reference to cultural interpretive lenses. CESs generally include 'Recreation,' 'Spiritual Experience,' 'Inspiration for Culture, Art, & Design,' 'Information for Cognitive Development,' 'Aesthetic Information,' and 'Cultural Heritage & Identity' (MEA, 2005; Böhnke-Henrichs et al., 2013). Of these, only recreation as the most tangible CES has been frequently economically valued in a marine context. However, cultural dimensions of the environment relevant to each of the other, less tangible CESs can be important drivers of individual preferences for environmental change. Furthermore, there is strong evidence that elements of culture can play a significant role in driving human behaviour (both generically and in response to environmental regulation), and individual economic preferences (Bame-Aldred et al., 2013; Hoehn and Thapa, 2009; Stamieszkin et al., 2009). The connection between the environment, elements of culture, and individual preferences means that important questions are how researchers might be able to approach the challenge of economically valuing changes in CESs and what the methodological limitations to economically valuing changes in CESs are. This is especially relevant in contexts where there is a strong signal being sent by policy instruments (like the European MSFD) regarding the increasing importance of economic assessments of environmental changes, as framed through an ES lens.

Although there is certainly controversy surrounding the notion of economically valuing CESs,<sup>6</sup> it is not the intention of this paper to engage directly with the larger normative question of whether or not, or under what circumstances, CESs should be economically valued. This much larger debate is beyond the scope of this paper. This paper focuses on exploring how CESs could be targeted using an economic approach to valuation, contingent upon one adopting the position that there may be some role for economic approaches to play in the assessment of CESs other than recreation. This paper therefore contributes to the literature that explores the question of how changes in the environment that are linked to CESs could, in practice, be economically valued.

Specifically, this paper develops and tests a pathway to the identification and economic valuation of CESs. The approach taken recognizes that culture can be a partial generator of ecosystem services and a driver of economic value. In so doing, this pathway enables researchers to make more explicit, and to economically value, some of the cultural dimensions of environmental change that have been largely unaddressed in the marine non-market economic valuation literature published to date<sup>7</sup>.

The objectives of this paper are as follows: (i) to highlight a number of key themes in the existing CES valuation literature (Section 2); (ii) to present, in response to these themes, a new pathway to the valuation of CESs that augments the "standard" (economic) ecosystem service valuation framework (Section 3); (iii) to present the outcomes of a case study application focused on Turkey and the Black Sea that followed this pathway (Sections 4–5); and (iv) to critically discuss this approach to CES valuation in light of the case study experience (Section 6).

## 2. Themes in cultural ecosystem service non-market economic valuation

As a part of the EU FP7-funded project ODEMM<sup>8</sup>, and in preparation for the design and delivery of this study, an extensive

review of the existing primary marine non-market economic valuation literature was conducted (Baulcomb and Böhnke-Henrichs, 2014).<sup>9</sup> This review identified 187 primary economic valuation studies published between 1975 and 2011 that were potentially transferable into an EU context,<sup>10</sup> and classified the studies according to the service valued (as defined by the typology outlined in Böhnke-Henrichs et al., 2013)<sup>11</sup>, the type of economic value estimated, and the non-market valuation methodology used. This review was augmented in December 2012 with a further search designed to yield peer-reviewed studies on cultural ecosystem services. Specifically, searches were conducted in ISI Web of Science using the terms *Cultur\** AND "stated preference" NOT *cell\**,<sup>12</sup> and *Cultur\** AND "ecosystem service" NOT *cell\**. Together, these two searches yielded more than 300 results, 77 of which were considered as being potentially relevant to the topic of the economic valuation of cultural ecosystem services (in either marine or terrestrial environments) and were subsequently evaluated for information on the economic valuation of CESs. This review process has highlighted a number of important themes, two of which warrant discussion here and in the context of CES valuation using non-market economic valuation techniques.

### 2.1. Theme 1: A single CES focus

Most of the valuation studies that relate to CESs either attempt to focus on a single CES (e.g. Bell et al., 2008; Gao and Hailu, 2011; Hu et al., 2009; Hunt et al., 2007), or on a highly unspecified bundle of value that are presumed to have some cultural undertones (e.g. Landry and Hindsley, 2011; Luisetti et al., 2011; Spurgeon et al., 2004). A focus on a single CES could, in at least some instances, have its origin in the reluctance of some researchers to apply a reductionist and trade-off focused framework/concept to research questions related to the environment, conservation, and culture (see Baron and Spranca, 1997; Chan et al., 2012; Daniel et al., 2012a, 2012b; Kirchhoff, 2012). A single CES focus may also, at least in some instances, have its origin in the fact that existing ecosystem service typologies typically lack the capacity to draw sufficiently clear boundaries between (i) individual ESs within each of the broad ES categories (i.e. provisioning, regulating, habitat, and cultural), (ii) the provision of any of the individual ES and the provision of the benefits that arise from those ecosystem services, and (iii) different economic values types (i.e. current use values, future use values, non-use values) (Boyd and Banzhaf, 2007; Chan et al., 2012; Chapman, 2008; Fisher et al., 2008, 2009; Fu et al., 2010; Wallace, 2007). Whatever its origins, however, this pattern in the literature is problematic given the lack of coverage for CESs other than recreation (Baulcomb and Böhnke-Henrichs, 2014). It means that little is known about the inter-linkages between CESs (i.e. about how the provision of an individual CES affects the provision of other CESs), and it makes it difficult, if not impossible to assess preferences for trade-offs between CESs.

<sup>9</sup> Complete details of the review can be found in the cited working paper. Additionally, the studies reviewed have been uploaded onto the Marine Ecosystem Service Partnership portal: (<http://www.marineecosystems-services.org/explore>).

<sup>10</sup> Here, we consider 'EU context' to include non-EU countries such as Norway, Turkey, Ukraine, and Israel that have close ties to the EU and that are relevant to the management of Europe's regional seas.

<sup>11</sup> There is a significant amount of debate within the ES literature on typologies. It is beyond the scope of this paper to engage with this debate, but key elements of this debate are discussed within Böhnke-Henrichs et al. (2013).

<sup>12</sup> It was necessary to use 'Not cell\*' in the search terms to ensure that studies related to microbiology and (quite literally) culturing cells were excluded from the results.

<sup>6</sup> Indeed, there are certainly some researchers who would, at one end of this debate, argue that economic approaches should *never* be applied to CESs.

<sup>7</sup> Unless stated otherwise, hereafter the word 'valuation' refers to 'non-market economic valuation', rather than the concept of valuation more broadly, or even the concept of value (which is broader still).

<sup>8</sup> ODEMM stands for 'Options for Delivering Ecosystem-Based Marine Management'. Further information is available at: (<http://www.liv.ac.uk/odemmm/>).

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