Manager strategies and user demands: Determinants of cultural ecosystem service bundles on private protected areas

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ABSTRACT

There has been limited consideration of the dynamic interactions between ecosystem service supply and demand. For self-funded private protected areas (PPAs), managers’ abilities to provide cultural ecosystem services (CESs) for which tourists are willing to pay may be critical to their sustainability. We predicted that a PPA’s management strategy would reflect the CES preferences of its visitors. Four CES bundles were identified across 21 South African PPAs: “safari experience”, “sense of place”, “natural history”, and “recreation”. Patterns in visitor preference for these bundles were strongly aligned with patterns in PPA management attributes. Preference for safari experience was documented on large PPAs with many game species and expensive, guided activities. Sense of place PPAs were small with few game species and cheap, self-guided activities. Natural history PPAs provided guided ecotourism to high quantities of day and overnight visitors, while recreation PPAs offered consumptive activities like hunting and fishing to small numbers of overnight visitors. Through their demand for specific CESs, PPA visitors both influence and respond to the management of PPAs’ ecological and socioeconomic attributes. Dynamic interactions between the demands of users and the strategies managers adopt to meet these demands can be important drivers of ecosystem service provision.

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1. Introduction

Understanding the contributions that ecosystems make to human wellbeing has become a notable theme in the conservation and sustainability sciences over the past two decades (Costanza et al., 1997; Kates et al., 2001; Millennium Ecosystem Assessment, 2005). The ecosystem services concept acknowledges the connections between ecological and socioeconomic systems and provides a common language and currency with which to assess them (Daily et al., 2000; Millennium Ecosystem Assessment, 2005). In quantifying ecosystem service provision, it is increasingly acknowledged that we need to understand both (a) drivers of the supply of services produced by the ecosystem; and (b) how services translate into benefits for people (Fig. 1; Potschin and Haines-Young, 2011; Spangenberg et al., 2014; Sukhdev et al., 2010).

The focus within this “cascade” of relationships between ecosystems and human well-being has been on developing ecological production functions with which to predict the supply of ecosystem services from a given landscape (Fig. 1 arrow 1; Crossman et al., 2013; Eigenbrod et al., 2010; Seppelt et al., 2011). There has also been consideration of how service supply translates into societal benefits, an inherently socioeconomic question that relates to ecosystem service demand and accessibility (Fig. 1 arrow 2; Geijzendorffer and Roche, 2014; Reyers et al., 2013; Wolff et al., 2015). The potential for ecosystem service demands and benefits to influence ecosystem management (Fig. 1 arrow 3) and thereby ecosystem characteristics and resultant service provision (Fig. 1 arrow 4) is, however, largely overlooked in ecosystem service studies (Daniel et al., 2012; Reyers et al., 2013; Spangenberg et al., 2014). Addressing this gap is critical for the future of global biodiversity conservation, because society expects the managers of many of the world’s most biodiverse areas to meet a range of societal demands in addition to those of conservation. For example, in Australia’s Great Barrier Reef World Heritage Area, the demands of fishers for continued offtake of desirable fish species, such as coral trout, have a strong influence on management actions (Russ et al., 2008). The expansion of no-take zones that function as refugia for a range of ecologically important species is more easily justified to the public through their positive impacts on the quality of the fishing experience, an
ecosystem service, than their more general biodiversity conservation value (Russ et al., 2008). Management responses to ecosystem service demand can thus be significant drivers of ecosystem service provision. While demands for ecosystem services may push managers to manage ecosystems in ways that benefit biodiversity (Maciejewski and Kerley, 2014), this will not always be the case. There is thus a very real danger that in the Anthropocene, the conservation value and sustainability of key biodiversity assets will be eroded by societal demands for particular ecosystem services.

Protected areas represent a core strategy for in-situ biodiversity conservation (Rodrigues et al., 2004; Watson et al., 2014). We have some understanding of the types of ecosystem services supplied by protected areas, including provisioning (e.g., natural resources), regulating (e.g., carbon storage, erosion control, pollination) and cultural (e.g., recreation, education, heritage) services (Cumming, 2016; Palomo et al., 2013). We have almost no understanding, however, of whether and how protected area managers adjust their management actions to meet demands for these services (García-Llorente et al., 2016). Given the lack of information regarding the compatibility between ecosystem service- and biodiversity-focused management, it is also unclear whether protected areas should attempt to meet ecosystem service demands if their primary objective is biodiversity protection (Cumming and Maciejewski, in press; Rodrigues et al., 2004). In a time of global change, efforts to maximise numbers of charismatic species, create open habitats that are suitable for game viewing, or offer increased access to endangered populations by potentially pathogen-carrying tourists will not necessarily build ecological resilience and sustainability.

Privately-owned protected areas, with their diverse and sometimes financially-oriented objectives (Langholz, 1996; Stolton et al., 2014), offer an interesting case study with which to assess the potential interactions between management approaches and ecosystem service demand. While definitions for private land conservation are varied (Kamal and Brown, 2015; Stolton et al., 2014), in this study we refer to private protected areas (PPAs) as land parcels of any size that are managed for biodiversity conservation and possibly for nature tourism and/or wildlife-based ventures; protected with or without formal government recognition; and owned or otherwise secured by individuals, communities, corporations or nongovernment organizations. In addition to a focus on biodiversity conservation, some PPA owners state income generation to be important and run commercial tourism operations in order to achieve this objective (Langholz, 1996; Stolton et al., 2014). These commercial PPAs represent a rapidly growing industry in several parts of the world, particularly in east and southern Africa and Latin America (Langholz, 1996; Stolton et al., 2014).

In order for a PPA to generate an income from tourism, it must provide the cultural ecosystem services that tourists demand (De Vos et al., 2015). Cultural ecosystem services (CESs) are defined as the “non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences” (Haines-Young and Potschin, 2013; Millennium Ecosystem Assessment, 2005). Several studies have found patterns in visitor demand for CESs to vary between protected areas. For example, while two protected areas in Spain were deemed important for nature tourism, visitors rated existence and aesthetic values as important in just one of the two (Garcia-Llorente et al., 2016). Similarly, the demands of visitors to South African national parks (i.e., government owned and run protected areas) form unique CES “bundles”, or groups of CESs that occur on a given protected area (Ament et al., in press). These unique bundles represent visitor demands for “safari experiences”, “natural history”, “sense of place”, “recreation” and “outdoor lifestyle”. Notably, parks were found to be characterized by visitors demanding just one or two CES bundles, indicating distinct differences in CES demand across parks (Ament et al., in press).

The tourism literature suggests that the benefits people receive from nature will be influenced by both ecological factors, such as the presence of charismatic or rare wildlife, and socioeconomic factors such as affordability, accessibility and facilities (De Vos et al., 2015; Lindsey et al., 2007; Tao et al., 2010). Initial decisions regarding where to situate a PPA, and subsequent decisions on how to manage it, may therefore influence the CESs that are supplied. For example, choices regarding the location of a PPA will determine its land cover, topography and how accessible it is to prospective visitors. Management decisions further include the number of game species to introduce, the quantity and quality of accommodation to build, and whether to offer consumptive recreational activities (such as hunting and fishing) or non-consumptive ecotourism activities (such as game drives and hiking). These management strategies have been found to vary widely across both national parks and PPAs in South Africa (Child et al., 2013; Clements and Cumming, in press; De Vos et al., 2015).

We hypothesize that people choose to visit PPAs where they believe their CES demands will be met (Fig. 1 arrow 2: the value of ecosystem services to people) and that PPA managers adjust their management strategies in response to perceived visitor demands for CESs (Fig. 1 arrows 3&4). We therefore predict that (a) we will observe alignment between the adopted management strategies on PPAs and their visitors’ CES demands, and (b) more financially-motivated PPA owners will adopt management strategies that attract visitors seeking CESs that give higher financial returns. In order to test these predictions, we obtained information on the management strategies of PPAs in South Africa and the CES preferences of their visitors. We tested for patterns in the CES preferences of PPA visitors, and assessed whether these patterns corresponded with PPAs’ adopted management strategies. Finally, we assessed whether PPAs with financial objectives attracted visitors with a preference for CES bundles that have higher revenue-generating potential.
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