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Analysis

Ecological Restoration of a Coastal Wetland at a Mass Tourism Destination. Will the Recreational Value Increase or Decrease?

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ABSTRACT

The ecological restoration of coastal wetlands is vital to preserving the integrity of these valuable ecosystems. However, the implementation of ecological restoration should also consider its potential negative effects. This study aimed to evaluate the socioeconomic value of the ecological restoration of a coastal wetland at a mass tourism destination on Costa Brava (Spain). To achieve this objective, 1) we developed a pooled model that combined travel costs and contingent behavior (TC + CB) to assess the influence of ecological restoration on the destination's recreational value, and 2) we performed a cluster analysis and post hoc comparisons after obtaining visitor profiles to understand how restoration influences tourists' contingent behavior. The results of the TC + CB model indicated that wetland recreational value is not significantly affected by restoration. The cluster analysis identified three visitor profiles (*Indifference*, *Recreation* and *Preservation*) with unique attitudes toward the wetland and its ecological restoration. These visitor profiles exhibit differences between actual and contingent visiting rates. Notably, the wetland's recreational value will be altered in opposite directions by ecological restoration. Visitors attracted by the natural setting will visit more often, whereas visitors who use the wetland for recreational purposes will tend to visit less often.

1. Introduction

Ecological restoration (ER) in coastal wetlands is important for myriad reasons. Coastal wetlands are the most degraded ecosystems in the world due to constant human pressure (Zhao et al., 2016). Moreover, coastal wetlands offer a substantial variety of ecosystem services (ES) that support the wellbeing of many local communities (MEA, 2005a), including protection against extreme climatic events, such as floods and hurricanes (Birol et al., 2009; Kim and Petrolia, 2013); providing sources of food and water (Smardon, 2012); and offering recreational opportunities for local inhabitants and tourists (Smardon, 2006). This last group of services is included in the category of cultural ES, which are defined as "the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences" (MEA, 2005b:40). The citizens of developed countries, both inhabitants and tourists, place high value on the cultural ES provided by their wetlands (Ghermandi and Nunes, 2013), particularly in the context of small wetlands in densely populated areas (Brander et al., 2006; Chaikumbung et al., 2016). Recreational activities and tourism in these areas allow people to benefit from many complementary cultural services, such as aesthetic appreciation or spiritual enrichment. Therefore, such activities represent a good opportunity to involve society in ecological conservation (Schaich et al., 2010). However, conservation biologists often view recreational activities and tourism as a threat to ecological conservation (Daniel et al., 2012) because these activities sometimes conflict with the goals of conservation.

Similarly, ecological improvements from ER can conflict with cultural ES (such as recreational use) or with the aesthetic preferences of visitors (Birol et al., 2009). Some ER projects involve social conflicts or may even become infeasible due to disengagements between ecological and cultural values (Buckley and Crone, 2008). Therefore, to ensure sustainability, wetlands ER should consider not only its ecological implications but also the negative impacts it might have on local inhabitants and tourism. In seeking to better understand the social effects (both positive and negative) of wetlands ER, many scholars have focused on valuations of the costs and benefits of this type of intervention in monetary terms (e.g., Carlsson et al., 2003; Milon and Scrogin, 2006; Scholte et al., 2016). However, these studies frequently disregard cultural ES due to the complexity of quantifying services based on visitor perception rather than on objective features (Brancalion et al., 2014; Tengberg et al., 2012). This practice is particularly concerning when ER

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is planned within cultural landscapes in which cultural ES have an important role, which is the case for landscapes in mature coastal destinations that enjoy a long tradition of developed tourism. In those cases, a decontextualized and globalized vision of ER is highlighted (Ruoso et al., 2015) that neglects previous functions of the landscape and imposes changes based on a natural sciences paradigm that tends to ignore the cultural preferences of the beneficiaries of ES (Tengberg et al., 2012). As a result, society's commitment to ER weakens (Moreira et al., 2006).

In these tourism contexts, the most common consequence is a deterioration of recreational opportunities, conceptualized as a reduction in the number of visits and a decrease in the level of visitor satisfaction (Buckley and Crone, 2008). Some authors (e.g., Milcu et al., 2013) have argued that in communities that are highly dependent on tourism, recreational functions and ecotourism should be classified as a provisioning – rather than a cultural – service comparable to water and food provision. Hence, reducing the number of visitors, which might be considered positive in certain areas, is unwelcome in regions in which tourism is the main economic resource.

1.1. Economic Valuation of Recreational Uses

The socioeconomic value of ER can be assessed by converting all non-market values into monetary terms, which facilitates the assessment of the viability of ER projects. Concurrently, economic valuations of ES offer a clearer understanding to society and its decision makers regarding the importance of these ecosystems (Chan et al., 2012). Many economic valuation methods have been used to estimate cultural ES in monetary terms. These methods commonly provide an estimation of the social benefits of an ecosystem using procedures that measure citizens' willingness to pay (WTP) to preserve beneficial ES for the future (Barbier et al., 1997).

Travel cost (TC) models are the most widely accepted to assess the value of recreational functions in wetlands because WTP is based on revealed preferences of visitors (RP), i.e. actual visits to the study site (Gürlük and Rehber, 2008; Lamsal et al., 2016; Mangan et al., 2013; Zekri et al., 2011). However, the TC approach is limited in its capacity to assess how potential or hypothetical environmental changes to ecosystems may influence recreational demand (Endo et al., 2012; Whitehead et al., 2000). To overcome this shortcoming, TC models have often been combined with contingent behavior (CB) data. CB models ask individuals to state their intended behavior if a hypothetical change occurred to the environmental features at the site under investigation (Lienhoop and Ansmann, 2011). Combining TC and CB allows for the evaluation of how visiting rates to a site, and thus the value of its recreational uses, would be affected by a change in the environmental characteristics or in the price per visit (Whitehead et al., 2000). Nevertheless, combining TC and CB data has led to controversy resulting from the comparison of real data (actual visits) with data based on hypothetical scenarios (contingent visits). For instance, Jeon and Herriges (2010) concluded that combining TC and CB generated significant bias because contingent visits were inflated in comparison with real post-change trips under the same conditions. In contrast, Grijalva et al. (2002) found that contingent visits were a significant predictor of real post-change trips. Alberini et al. (2007) could not find evidence of a bias that was sufficiently important to invalidate the visiting rates estimated from CB data. Whitehead et al. (2010) compared three types of models that combined actual and contingent visits and found that using pooled models (that combine TC and CB data in a unique regression model) is the most reliable approach.

Consequently, many scholars have used pooled TC + CB models to evaluate environmental changes in wetlands or other water-based landscapes. In some models, contingent scenarios have indicated significantly different recreational demands, meaning that the change evaluated substantially modified the frequency of visits (as represented by the demand function). This was particularly the case regarding changes in water quality in a tidal flat on Ganghwa Island (South Korea), where Endo et al. (2012) compared three scenarios with different water qualities. The results demonstrated the significance of water quality in determining recreational demand. Similar results were shown by changes in water quality on the beaches of southeast Scotland (UK) (Hanley et al., 2003) and in a water reservoir in the Ore Mountains (Germany) (Lienhoop and Ansmann, 2011). In the latter case, increasing the water level scenarios resulted in significantly increased recreational demand. Becker and Friedler (2013) applied a pooled TC + CB model to an ER plan on an Israeli river and found that changes in water quality and rate of flow led to an increase in the recreational value of the river. Nonetheless, other studies have indicated that environmental changes do not always influence recreational value. This was the case for sports fishing in the Lagoon of Venice (Italy), where a hypothetical increase in the catch rate did not lead to a significant increase in contingent fishing trips (Alberini et al., 2007). Similarly, water levels did not seem to change the demand for recreational use on Walker Lake in Nevada (USA) (Eiswerth et al., 2000), and water clarity did not change that demand at Delavan Lake in Wisconsin (USA) (Eiswerth et al., 2008).

1.2. Aims

The main aim of this study was to evaluate the socioeconomic value of wetlands ER at a coastal tourism destination in the Costa Brava region (Spain). Specifically, this study analyzed whether the ER of a coastal wetland located in a mass tourism destination would affect its recreational demand. In other words, we determined whether the project would increase or decrease the social value of wetland recreational services in monetary terms. Due to the recreational culture in Costa Brava, which serves as a specialized tourism destination, recreational value can be assumed to be socioeconomic value because the local economy is highly dependent on recreational activities. In addition, recreational activities by local inhabitants clearly contribute to their wellbeing, as many recent studies have shown (e.g., Hermann et al., 2011; Iniesta-Arandia et al., 2014; Willis, 2015).

To achieve the objective, we implemented a TC + CB model using a real scenario, which is one of the most notable contributions of our study because most previous research is based on hypothetical scenarios, which may lead to biases in visitors' answers (Grijalva et al., 2002; Jeon and Herriges, 2010). Furthermore, this study employed a cluster analysis to explore the relationships between visitor profiles and the changes in recreational demand of the wetland caused by the ER. This analysis sheds light on how visitor's profiles influence recreational demand after an ER project is proposed. This topic has rarely been explored in the literature.

The paper proceeds as follows. Section 2 describes an ER project in a Costa Brava wetlands area and contextualizes the tourism destination in which it is located. Section 3 discusses the procedures used to implement different TC + CB models, the cluster analysis and the post hoc comparisons. Section 4 presents and discusses the main results. Section 5 concludes and discusses the main implications of the study of the ER of coastal wetlands at tourism destinations.

2. European Union Life Project PLETERA

The Pletera coastal wetland is located in the Natural Park “Montgrí, Illes Medes i Baix Ter” in Costa Brava, one of Spain's – and Europe's – most attractive tourist destinations (Fig. 1). Despite the presence of this and other natural areas of high ecological value, Costa Brava tourism is focused on sun and beach resources (Sardà et al., 2009). In Catalonia (Spain), the region where Costa Brava is located, tourism represents 12% of the GDP and 12.6% of employment based on 82 million overnight stays per year, which are concentrated in the coastal municipalities. Coastal municipalities provide 80% of the region's accommodation beds and host 80% of the overnight stays (Generalitat de