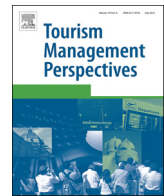




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Tourism impact assessment: A tool to evaluate the environmental impacts of touristic activities in Natural Protected Areas

Marcelo Canteiro^{a,*}, Fernando Córdova-Tapia^b, Alejandro Brazeiro^c

^a Departamento de Zoología, Instituto de Biología, Universidad Nacional Autónoma de México, Mexico

^b Centro de Investigación en Biodiversidad y Conservación, Universidad Autónoma del Estado de Morelos, Mexico

^c Instituto de Ecología y Ciencias Ambientales, Facultad de Ciencias, Universidad de la República, Montevideo, Uruguay

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ABSTRACT

Tourism may be an ally or a threat to conservation. The expansion and diversification of tourism had an increasing environmental impact on protected ecosystems. Therefore, it is important to assess and anticipate the potential impacts of tourism on Natural Protected Areas (NPA), to articulate the public use of NPA and their conservation. The Tourism Impact Assessment (TIA) is a methodology for evaluating the environmental impacts associated with tourism in NPA. We tested TIA on three NPA of the National Protected Areas System of Uruguay. We identified fifteen main tourist activities that can affect four biological components (i.e., biodiversity, plant coverage, soil and water), and 21 potential impacts. The severity of these impacts was evaluated for each area based on expert consultation. We conclude that TIA is a practical tool to assess, monitor and prevent tourism impacts in NPA that can be used to reach a sustainable tourism management.

1. Introduction

Intensive use of ecosystems can generate a reduction in the provision of benefits that the ecosystems provide (ecosystem services), a greater chance for non-linear risks and an increase in poverty and inequality (Reid Walter et al., 2005). These effects decrease the benefits that future generations can obtain from ecosystems (Chapin III et al., 2000). Thus, one of the strategies for conservation applied worldwide is the establishment of Natural Protected Areas (NPA). In these areas, the use of natural resources is planned and managed to reach specific objectives for the conservation of certain conditions or processes, such as wild species populations, habitat, the natural landscape or diverse aspects of biocultural heritage (Boege, 2008; UN – UNITED NATIONS, 1992; Pohlenz et al., 2013). Worldwide, a total of 217,155 protected areas have been established, covering 14.7% of the terrestrial surface and 4.12% of the total marine area on the planet (UNEP-WCMC and IUCN, 2016).

Tourism can be a threat or an ally for conservation in NPA, depending on its compatibility with conservation objectives, which can be determined by management planning (Balmford et al., 2009; Deguignet et al., 2014). Globally, tourism is one of the most important economic and social phenomena of the 21st century, characterized by a rapid expansion of the industry and by the growing tendency of tourists to visit new destinations (WTO, 2016). According to the World Tourism

Organization (WTO), 25 million of tourists traveled internationally in 1950, compared to 674 million tourists in 2000 and 1186 million in 2015 (WTO, 2017). The economic resources generated by tourism also increased, going from 2000 million in 1950 to 495,000 million in 2000 and 1,260,000 million in 2015 (WTO, 2017). According to the WTO (WTO, 2016), in countries that emit great numbers of tourists, like European and North American countries, there is a tendency among tourists to seek out tourism focusing on experiences, adventures and visiting “authentic sites”. For this reason, Asia, Africa and Latin America, continents with great natural patrimonies, have become touristic spotlights of the world (SCDB – Secretariat of the Convention on Biological Diversity, 2015).

Tourism used to be a massive phenomenon concentrated in coastal zones and in summer time, following a “sun and beach” model. During the last few decades, tourism has experienced substantial expansion and diversification (MINTUR – Ministerio de Turismo y Deporte de Uruguay, 2009; SCDB – Secretariat of the Convention on Biological Diversity, 2015). A new type of tourism arose from this process of expansion, known as ecotourism (Riveros & Blanco, 2003; WTO, 2002), which is defined as “all forms of tourism based on nature and in which the tourist's main motivation is the observation and appraisal of nature or the traditional cultures predominant in the natural zones” (WTO, 2002). In countries that receive tourists mainly during summer time around the coast fringe, like Uruguay, ecotourism development could

* Corresponding author.

E-mail address: marcelo.canteiro@st.ib.unam.mx (M. Canteiro).

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contribute to expand the zones and seasons of tourism. Due to growing demand, the number and diversity of the localities and products linked to ecotourism increased (Barrera, 2006; Reid Walter et al., 2005).

Protected areas worldwide receive almost eight million visitors annually, which generate revenues up to 600 million dollars per year in receiving countries (Balmford et al., 2015). Tourism in protected areas should be framed within ecotourism principles and should contribute to reach the conservation targets of the area (Eagles et al., 2002). Given that biodiversity is one of the main ecotourism attractions, there is an urgent need of tools to prevent negative environmental impacts of tourism-related activities (SCDB, 2015; Marion et al., 2016). In addition, to ensure that ecotourism can contribute to the long-term conservation goals of protected areas, tourism activities should be properly monitored, assessed and managed (Das & Chatterjee, 2015).

The contribution of tourism to conservation goals can be achieved through the tourist's interest towards understanding of the natural environment and the protection of natural and cultural heritage (Andy & Moore, 2005; Das & Chatterjee, 2015; López Bonilla & López Bonilla, 2008). However, not all tourism activities carried out in protected areas generate tourist's conservation concerns (Geffroy et al., 2015; Pickering & Hill, 2007; Zhong et al., 2015). Thus, it is important to understand the benefits as well as the negative impacts that tourism may have on the environment, society and the economy in order to develop appropriate management plans that correspond with long-term sustainability goals (Eagles et al., 2002; Job et al., 2017). Some of the main negative impacts related to touristic activities on protected areas include changes on land cover and land use, an increase in the demand of natural resources, pollution, urbanization and acquisition of land by new actors, changes in the structure of resource management, infrastructure creation, an increase in volume of waste produced, and an amplification of local inequality ((Andy & Moore, 2005; Cañada & Gascón, 2007); López & López, 2008).

Two approaches have been widely used to assess and manage the negative impacts of tourism: Tourism Carrying Capacity (TCC) and Limits of Acceptable Change (LAC) (Bentz et al., 2016; Bera et al., 2015). The TCC is defined as “the maximum number of persons that can visit a tourism destination at the same time, without causing destruction of the physical, economic and social-cultural environment nor an unacceptable decrease in the quality of the visitor satisfaction” (WTO, 1982). In synthesis, this concept tends to establish a limit on touristic activity according to the priorities of local managers and planners (Coccosis & Mexa, 2017; Echamende Lorente Pablo, 2001). The weakness of this management tool stems from a basis on a fixed number, calculated for a certain time and under certain conditions. Therefore, it is not flexible in response to temporal changes both in environmental and social conditions (Calderón, 2016), but nonetheless has remained as one of the most frequently used techniques (Bera et al., 2015). In contrast, the LAC focuses on setting thresholds of acceptable changes under environmental settings, and requires the definition of indicators, standards and monitoring programs to assess the magnitude of changes (Boyd & Butler, 1996). This approach uses both biophysical indicators and users' perceptions as potential inputs for assessment and monitoring (Bentz et al., 2016). One of the most important features of the LAC approach is that it contemplates the necessary actions to protect desirable conditions through a systematic, explicit, justifiable and rational process (Andy & Moore, 2005; Eagles et al., 2002). However, the process of defining limits of acceptable change faces crucial challenges like insufficient data, limited understanding of the natural variability, limited understanding of ecosystems or species resilience, and lack of understanding of what would actually constitute a change in ecological character (SEWPAC, 2012). Although these approaches have been successfully implemented in protected areas, there is still a need for a more flexible and practical tool.

2. The tourism impact assessment method

Traditionally, assessing environmental impacts begins with a detailed identification of pressures and system components, following by the identification and the classification of impacts according to their magnitude (EPA, 1992; EPA, 1998; Fernández-Vítora, 2009; Granizo et al., 2006; IAIA, 1999). This method has been widely used in environmental impact assessments to understand the negative impacts of infrastructure or extraction projects. Some of the principal limitations that have been recognized for this method are: it accommodates both quantitative and qualitative data; it does not distinguish between immediate and long-term impacts; and it aggregates in a single method various ecosystem changes that may not be comparable (Bowd et al., 2015). However, Leopold matrix provides a methodological framework flexible rather than arbitrary that can be potentially adapted to a broad spectrum of circumstances. In this study, we adapted the Leopold matrix method (Leopold, 1971), to develop an efficient and practical tool to determine environmental impacts caused by touristic activities in protected areas based on expert consulting.

The Tourism Impact Assessment (TIA) has five main advantages to previously described methods: 1) the application of the TIA does not require an expert, so it can be used by a wide range of actors related with the area like members of the community, government, enterprises or nongovernmental organizations; 2) it can be used to assess both the potential and the already occurred impacts; 3) it is based on the perception of local experts that are in constant interaction with the environmental components; 4) it does not take into account the users perceptions, prioritizing environmental conditions over user's experiences; 5) it is a flexible and practical tool that can be easily used as part of a monitoring program to guide tourism management and avoid irreversible deterioration. Additionally, we validated the TIA on three areas within the National System of Protected Areas of Uruguay (SNAP in Spanish). We selected the Laguna de Rocha Protected Landscape (LRPL), Quebrada de los Cuervos Protected Landscape (QCPL) and Cabo Polonio National Park (CPNP) to obtain a representative sample in terms on tourism activities and ecosystems. The application of this method could lead to better tourism planning and management that aims to conserve the components and functions of Natural Protected Areas.

3. The four steps of the TIA

3.1. Step 1: identification of pressures (touristic activities)

The first stage consisted in identifying all the tourism-related activities in the study area. In this study, we revised the Management Plans, or management plan drafts, of the 14 protected areas included in the SNAP in Uruguay. Then we conducted interviews with the directors and staff in charge of the areas to elaborate a full list of touristic activities. The interviews were conducted using a semi-structured approach (Ander-Egg, 2003) with two steps: (1) we sent the interview guidelines via email, and then we contacted the interviewee via telephone to schedule a face-to-face meeting; (2) during the face-to-face meeting we performed semi-structured interviews and included time to receive additional comments.

3.2. Step 2: selection of ecological components

To keep it simple, the ecological system of the protected areas that could suffer the pressures of tourism was segregated in four components, two abiotic (soil and water) and two biotic (biodiversity and plant coverage). However, it is important to point out that the definition of ecological components can be as exhaustive as each area requires it to be useful for its management. This allows for more flexibility in an adaptive management context.

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