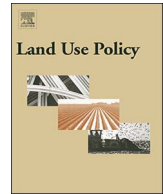


Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Land Use Policy

journal homepage: www.elsevier.com/locate/landusepol

Land use planning around protected areas: Case studies in four state parks in the Atlantic forest region of southeastern Brazil

Elizete Aparecida Checon Freitas Lima^{a,*}, Victor Eduardo Lima Ranieri^b

^a FEIS – Universidade Estadual Paulista “Julio de Mesquita Filho” – UNESP, Avenida Brasil, 56-Centro, – 15385-000 – Ilha Solteira, SP, Brazil

^b EESC – Universidade de São Paulo – USP, Avenida Dr Carlos Botelho, Brazil

ARTICLE INFO

Keywords:

Buffer zone
Protected areas
Management plan

ABSTRACT

The creation of buffer zones (BZs) around protected areas (PAs) has been proposed as a way to conciliate the effective protection of biodiversity and human occupation in surrounding areas. In this study, we seek to discuss some of the challenges to effective buffer zones, focusing our attention on investigating two instruments used for the planning of these areas: the management plan of protected areas, and the municipal master plan. To achieve this, we evaluated the planning of land use around protected areas, as established in the management plans of four protected areas, located in southeastern Brazil, as well as in the master plans of the municipalities covered by these protected areas. We found that these management plans established recommendations rather than specific rules for the use of resources of the buffer zones. Additionally, we verified no uniformity between the master plans on the topic of municipal zoning in the BZs of the PAs studied: only five of the fourteen master plans surveyed delineated a zone around the protected area and defined guidelines for land use consistent with its protection. The results of this study indicate that the use of the buffer zone as an effective strategy for the management of protected areas requires a link between the PA managers and the local government responsible for land use planning, in order to facilitate the articulation between the management plan of the PA and the municipal master plan. Otherwise, the establishment of the buffer zone risks being only a symbolic action, with no practical effect on biodiversity conservation within the protected area.

1. Introduction

Conserving the biodiversity of protected areas (PAs) depends, to a considerable degree, upon how the areas surrounding them are utilized. Different uses of the land in the vicinity of a protected area negatively impact the protected area, due to interference in ecological processes (De Fries et al., 2010), putting the conservation of species in the area at risk (Gaston et al., 2008). Changing the land use around PAs also threatens these areas by isolating them in the landscape, which impacts biodiversity (De Fries et al., 2007). Wittemeyer et al. (2008) evidenced an increase in human occupation around protected areas when they analyzed the surroundings of 306 protected areas in 45 countries in Africa and Latin America and found that protected areas attracted human settlements, mainly because of the economic development projects associated with them. PAs located in developed regions and surrounded by heavily settled agro-pastoral landscapes also face challenges in retaining their natural vegetation (Marques et al., 2016), despite the application of restrictive legal instruments (Terra et al., 2014). As a consequence, several conservation approaches at the

landscape level have been developed to improve the interaction of protected areas with their surroundings, among which is the buffer zone (BZ) model (Du et al., 2015).

The current literature on BZ has focused mainly on the social function of these areas and little attention has been given to the management of BZ (Perelló et al., 2012). Despite this, regulations for the creation and/or management of BZ have been reported in many countries (Ebregt and De Greve, 2000; Wallace et al., 2005; Paudel et al., 2007; Perelló et al., 2012; Weisse and Naughton-Treves, 2016), in a variety of political and socioeconomic contexts. It is important to examine the experiences of application of the BZ model with a view to improving this approach with regard to the interaction between PAs and their surroundings. We therefore seek to contribute to the discussion about the challenges of BZ implementation and management by presenting case studies on BZ planning in protected areas situated in a region of tropical forest in Brazil.

Brazilian legislation requires BZ creation for most categories of PAs and states that PA managers should establish specific rules for, and restrictions on, human activities in the BZ when the PA is created or

* Corresponding author at: Avenida Brasil, 56, Ilha Solteira, São Paulo, Brasil.
E-mail address: eaclima@bio.feis.unesp.br (E.A.C. Freitas Lima).

<https://doi.org/10.1016/j.landusepol.2017.12.020>

Received 27 October 2016; Received in revised form 4 December 2017; Accepted 6 December 2017
0264-8377/ © 2017 Published by Elsevier Ltd.

during the creation of its management plan (Brasil, 2000). Furthermore, the municipalities share responsibility with PA managers for land use planning in the BZ of the PAs when they draft the master plans. Are the management plans and master plans fulfilling their roles in the planning and implementation of BZ? How is the interaction of the PA with its surroundings addressed in the management plans? To answer these questions, we evaluated the management plans of four state parks located in southeastern Brazil, and concurrently discussed how the municipalities affected by these PAs are planning the land use in the regions surrounding the PAs. We hope that the presentation of this Brazilian experience can contribute to the understanding and improvement of the management of BZs around PAs in other countries.

We begin by presenting the conceptual framework of buffer zone management, with particular attention to the legal aspects in Brazilian legislation and their use as a tool to integrate nature conservation into land use planning. This is followed by a section that details the selection of the case studies, then by a section that explains how the management plans and master plans were analyzed. The next two sections present the results of that analysis, with the aim of understanding: how the parks selected for this study are planning their BZs; which actions are planned in their management programs regarding the integration of the PA with its surroundings; and how the municipalities affected by these PAs are planning land use in the regions surrounding the PAs. In the final section, we present our conclusions regarding land use planning in the BZ of PAs and we emphasize the contribution of the work to increase the understanding about this subject.

2. Conceptual framework

The concept of a buffer zone around a protected area originated with the intent of protecting people and crops from animals leaving the area. The BZ concept was later broadened, influenced by the biosphere reserve model developed by UNESCO in the 1970s. At that time, BZs were created mainly with the intention of increasing the habitat area of the PA and protecting it from outside impacts (Ebrecht and De Greve, 2000). More recently, the BZ concept has been mainly applied with the dual objectives of both protecting the natural area from negative human influences, and compensating the local populations that are impacted by the establishment of the protected areas (Ebrecht and De Greve, 2000; Budhathoki, 2004; Wittemeyer et al., 2008).

The concept of zones of interaction was developed as an evolution of the BZ concept; it designates an area between a protected area and its surrounding landscape that includes a set of hydrological, ecological, and socioeconomic interactions (De Fries et al., 2010). A scientifically-delineated zone of interactions as part of a landscape approach for PAs (Palomo et al., 2014) could help identify the most essential places and types of land uses for protecting the integrity of the protected area (De Fries et al., 2010). The concept of PAs has itself evolved, from PAs being conceived of as islands, to networks, to landscape, to the more recent socioecological approach (Palomo et al., 2014); however, there are still many challenges to an effective BZ model of conservation planning (Weisse and Naughton-Treves, 2016).

Land use planning around the PAs can not always adequately protect them from the impacts of development pressures; therefore, new approaches are required to meet this challenge, such as the established of BZs (Fidelis and Sumares, 2008). BZ implementation, however, is a complex process involving many issues, including the existence of varied and often contradictory territorial planning instruments affecting PAs (Garcia and Revah, 2013), and a lack of harmonization between local governments and the agencies responsible for the management of PAs (Wallace et al., 2005). For example, the actions delineated in the management plans would need to be incorporated into municipal master plans (Neves, 2012), as well as into the plans of various public bodies, to ensure that they are implemented (Stockdale and Barker, 2009). The need to clearly define responsibilities for BZ planning and management (Wallace et al., 2005; Mehring and Stoll-

Klemann, 2011; Guimarães and Pellin, 2015; Weisse and Naughton-Treves, 2016) is another challenge to face in BZ implementation, especially when considering that the areas around the PAs are commonly third-party properties (Vitali et al., 2009). In light of this, incorporating a socioecological approach into the planning and management of BZs has been recommended (Palomo et al., 2014), since the participation of local people contributes to their compliance with requirements (Ostrom and Nagendra, 2006; Andrade and Rhodes, 2012).

3. Brazilian planning legal framework

A BZ is defined in Federal Law 9985/2000 as the “area surrounding a conservation unit,¹ where human activities are subject to specific rules and restrictions, in order to minimize negative impacts on conservation unit” (Brasil, 2000). There are guidelines for the design of the BZ, which can be established when creating the PA or during the preparation of its management plan (Galante et al., 2002). A management plan is defined in the as “a technical document which, based on the general objectives of a conservation unit, establishes its zoning and the norms that should govern the use of the area and the management of natural resources, including the implementation of the fiscal structures necessary for the management of unit” (Article 2, Federal Law 9985/2000). It should cover “the area of the conservation unit, its buffer zone and ecological corridors, including measures to promote its integration into the economic and social life of neighboring communities” (Article 27, Federal Law 9985/2000). It is important to highlight that the BZ is located outside the conservation unit, in a territory that is not under the jurisdiction of the governmental agency responsible for the management of the conservation unit. However, the agency responsible for the conservation unit must establish specific rules regulating the occupation and use of the resources of the BZ (Brasil, 2000).

Another important legal guideline for BZ management is the Conama Resolution 428/2010, which regulates the licensing of activities with significant environment impact in the BZs of conservation units. Licenses for such activities can only be granted with the authorization of the governmental agency responsible for the management of the conservation unit. In the case of licensing activities that can affect the conservation units or their BZs, but which do not cause significant environment impact, the governmental agency responsible for management of the conservation units need only be informed (Brasil, 2010).

4. Material and methods

4.1. Study area

The area chosen for the study was the coastal zone of the state of São Paulo, located in a region of the Atlantic Forest. The Atlantic Forest is a global biodiversity hotspot, and was declared a biosphere reserve by UNESCO in 1991 (SOS Mata Atlântica, 2015). This area was chosen due to a number of characteristics, including the fact that it is the region of the state of São Paulo with the largest number of protected areas and the largest percentage of Atlantic Forest remnants. The region brings together a multitude of economic and social development characteristics, from small tourist towns to heavily industrialized cities.

4.2. Selection of the case studies

For the purposes of this study, we considered only conservation units belonging to the class of “strictly protected”, that were situated in the terrestrial segment of the coastal zone of the state of São Paulo, and

¹ The conservation units are the protected area defined in the Federal Law 9985/2000 with the objective of ensuring biodiversity protection. They are divided into two main classes: strictly protected conservation units and sustainable use conservation units.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات