

## Aspects of carrying capacities and recreation management: The case of Triglav National Park, Slovenia

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### Abstract

Overall, protected areas, and predominantly national parks, are facing increasing visitation. The national parks are recognized as 'brands' for an authentic nature experience and also as 'playgrounds' for numerous recreational activities. In recent years the development of recreational activities has been rapid and accelerated by the tourism, marketing and equipment industries. Management institutions in protected areas need to survey the activities that are practiced within their respective boundaries as well as understand the potential impacts. Future protected area management needs to be in accordance with nature protection goals. The paper presents various aspects of carrying capacities in the Triglav National Park (TNP), Slovenia that are related to visitation and recreational activities.

### Key words

recreation, carrying capacities, protected areas, Triglav National Park, Slovenia.

### Introduction

Visitation within protected areas in Slovenia has been continuously increasing, and visitors are also practicing diverse recreational activities depending on the natural conditions of the areas. Increased visitation and changing demands of visitors represent specific challenges to management institutions which aim to conserve the natural and cultural heritage and also enable good experiences for park visitors. From a management perspective systematic visitation monitoring is important in order to recognize the so called 'hot spots' as well as emerging and potential future management conflicts in these protected spaces. Surveying the status and changes in the natural environment in relation to visitation helps to identify informed and practical measures in visitation management (i.e. with information infrastructure). One of the most demanding tasks of protected areas management institutions is the estimation of various carrying capacities based on data (i.e. visitation surveys, biodiversity monitoring) and expert assessments (MRAK 2014). Triglav National Park (TNP) is the only national park (IUCN categories II and V) in Slovenia, located in the predominantly mountainous northwest part of the country (Fig. 1). TNP is 83 982 ha and includes 33 permanent settlements with 2420 inhabitants (MANAGEMENT PLAN. 2016). Visitation of the park has never been systematically surveyed and only estimations of visitor numbers were made within partial studies (i.e., ŠOLAR 2009, CIGALE et al. 2010). Due to observed and documented visitation pressures, in 2016 the TNP management in collaboration with its own expert team and external experts launched a study focused on park visitation. The main research goals were to establish a systematic survey of park visitors to be used as a basis for visitor management and for TNP infrastructure planning; to identify and define measures for nature conservation and the protection of cultural heritage; and to begin a process of monitoring various aspects of carrying capacities (environmental, social, economic and physical).

### Methodology

The first research phase consisted of identifying all of the official sources of data related to park visitation that are available. The focus was to prepare a baseline dataset that will be used to guide systematic visitation monitoring in the future. The data from previous partial studies were considered in this first phase as well.

The data on visitation were gathered using survey questionnaires that addressed visitors' motives, planned activities, length of stay, frequently visited areas, and so forth. The aim was to get information on why people come to the park, what they do there, where they go and for how long. Part of the survey focused on sustainable mobility in the park and the last set of questions was related to visitor concerns regarding current and future environmental changes. All together 1718 questionnaires were filled either in the park area or over the survey webpage. The majority of respondents were visitors (86 %) followed by park inhabitants (11 %) and second home owners (3 %). In the first phase descriptive statistics were used to identify the basic trends. We calculated frequencies and descriptive statistics as measures of centrality and dispersion. In the second phase some advanced statistical methods were applied. A clustering method was used to divide respondents into groups (i.e., clusters) based on their characteristics.

## Results and discussion

TNP and its vicinity (the Man and Biosphere Reserve of the Julian Alps) had 30 474 beds in 2014 (24, 7 % of the total number of beds in Slovenia). In the same area in 2014 there were 1 880 047 overnight stays (19,6 % of all the 2014 overnight stays in Slovenia). The data show how significant the wider area of TNP is within the tourism sector of the entire country. The analysis of survey data shows that the prevailing recreational activities, and therefore motives, to visit the park are as follows: mountaineering; experiencing natural and cultural heritage sites; swimming; and biking. Ascent of Mount Triglav (2864 m), the highest peak of Slovenia and national and cultural symbol is also among the top six reasons for visits within the park. Ascents are most frequent in the summer months. Significantly, the seasonal pressures increase the hazardousness of mountaineering routes and diminish the general experience of the mountain summit. The data from the Mountain Rescue Service of Slovenia show the highest numbers of accidents in the area of Triglav. One of the possible interventions in the future could be daily mountaineering quotas and the establishment of a reservation system for the ascents. The most visited areas in the park (Fig. 2) are facing severe pressures from visits and intense motorized traffic predominantly in summer months. The majority of visitors reported that they stay in the park one day and the most important value of the park is its nature and the opportunity to enjoy in peace and silence. The most visited areas are related to high motorized traffic density which represents environmental hazard (e.g. air pollution). Traffic pressures are also disturbing local inhabitants, especially in the area of Bohinj Lake. The survey showed that visitors are willing to use sustainable mobility options (i.e. walking, biking, and public transportation), although i.e. Soča Valley and Vršič pass remain perceived as the areas most efficiently visited by car. Identifying measures to solve the traffic situation in the park during summer months is one of the biggest challenges for park management. Any efforts in this area need to be defined in cooperation with local communities; in addition pressures to access TNP from other areas in Slovenia will have to be solved with support at the national level. Future visitation management will need to be well considered in terms of existing infrastructure carrying capacities (i.e. parking lots, number of beds, etc.) and an effective information system will enable oversight of the park visitation.



Figure 1: Location of Triglav National Park

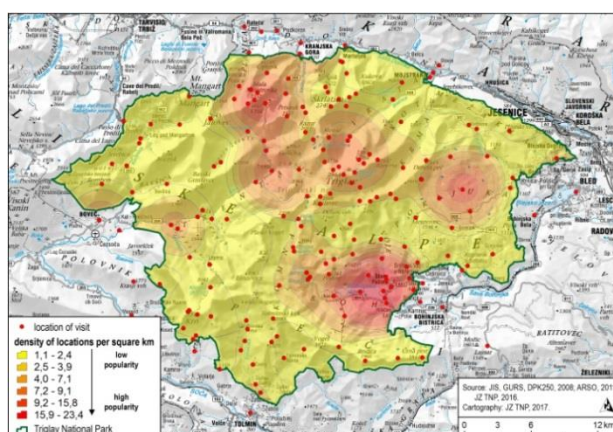


Figure 2: Most visited areas in Triglav National Park

Environmental carrying capacity is not yet defined, although the most valuable areas within the park are known. The park management goal is to keep certain areas as 'peace zones' where visitation is not encouraged. However, environmental quality should be monitored in relation to visitation throughout the park. Where degradation by visitor pressure is observed, measures will need to be taken such limiting the number of visitors or banning access to certain areas in conjunction with educational and informational activities (i.e. guided tours, events for various target groups, etc.) in order to raise awareness about the importance of conservation. Social carrying capacity related to recreation in the park will need further investigation in the future. Yet, some indications can be reached through an in-depth analysis of the survey results in the next phase and considered in park measures related to visitation. Nevertheless, the quality of life of the local population should not be threatened by the rising numbers of visitors and the diversity of outdoor recreational activities. On the other hand, tourism and recreation in the park represent an important economic opportunity also for the park inhabitants.

## Conclusions and future challenges

The main TNP management challenges are to assure positive park experiences for local inhabitants and visitors and to achieve conservation goals. Within the research on visitation in the TNP that was started in 2016, the initial data that are crucial for the preparation of the visitation monitoring action plan were gathered and analyzed. In the next steps the research is and will be focused on visitation-related environmental, social and economic impacts. One of the important missing data is the total annual number of visitors which shall be gained through setting up a network of counters. Special attention shall be given to the most visited areas in order to follow a sustainable tourism development path. Finally, the research and management challenges underscore the environmental changes underway and their impact on visitation and recreational activities.

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