

Going Ahead: From Visitor Monitoring to Recreational Use Monitoring – The Example of the EU Regional Recreation Area Berchtesgaden National Park / Salzburger Kalkhochalpen

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Abstract: Recreation is an important issue for protected areas and especially for national parks where visitor numbers are growing. This can be seen as a result of the increasing interest in nature- and landscape based recreation. Consequently, there is a rising demand to manage this kind of human use accordingly. Therefore, measures must be based on well-founded data as well as widespread knowledge and understanding of recreation. Associated investigations must not only focus on visitors. Interest must also inhere to infrastructure, nature- and landscape compatible activity forms, and stakeholders. Another aspect is the need to incorporate protected areas in a larger planning framework. All too often national parks are regarded as something apart from the adjacent lands. But particularly recreation in park areas cannot be seen separately from the surroundings. By integrating all data regarding to recreation in databases and GIS, persons responsible for management-decisions can gain a comprehensive impression of this object. An according monitoring-system considering feasibility and continuation as well as the (future) workflow is worked out in an exemplary manner within the scope of the InterReg-IIIa project “EuRegional Recreational Area Berchtesgaden National Park/Salzburger Kalkhochalpen”.

Introduction

Recreation is one of the main purposes of national parks. Since years the interest in nature- and landscape based recreation increases. As a result visitor numbers are still growing, especially in Central European national parks. Consequently, a rising demand to manage this kind of human use accordingly can be observed in protected areas. To comply with this, adequate measures, concepts and guiding principles must be developed. They should be based on well-founded data and information as well as widespread knowledge and understanding about recreation, its dependencies and coherencies. However, corresponding studies of recreation focus mainly on visitors so far: Today investigations in form of visitor monitoring (e.g. numbers, characteristics, behaviour, and expectations) are an essential component of proactive and adaptive

park management. In order to support visitor management, which at present faces more and more visitors as well as an increasing number of forms of activity (e.g. ski-hiking, snowshoeing, nordic walking), it must be pointed out that not only visitors must be a matter of investigation, but also the whole object of recreation as a further comprehensive conception of park visits and visitors.

Even though, literature research clarifies the numerous different aspects of relevant data and information as well as methods (compare e.g. Muhar, Arnberger & Brandenberger 2002, Hennig & Laube 2005), unfortunately, recreation and recreational activities are generally poorly understood and poorly documented (see Payne et al. 2004). It is marked by estimations and the absence of reliable information. Furthermore, almost all aspects (e.g. methods, data, and concepts) relate to visitors and not to the abstract object of “Recreation”.

Moreover, data and information regarding to visitors or recreation are often not well integrated in existing information structures and systems like databases and GIS (Giles 2003). However the digital availability of data and information is an important issue. This facilitates a comprehensive insight into recreation to persons responsible for management-decisions.

In consequence, different demands result: First, nature and landscape compatible recreation in national parks must be analysed to crystallize and model its key-components. Second, an adequate information system must be designed, to integrate and bring together all relevant data and information. This is done in an exemplary manner for the German Berchtesgaden National Park. The main purpose is to end up with a recreational use monitoring system which can be seen as a more widespread visitor monitoring. This way, it should be possible to give answers continuously to different questions concerning recreational use within the park area.

Study area focussing recreational use

Besides nature protection, research, and environmental education the opportunity to recreation is one main objective in the German Berchtesgaden

National Park. The Berchtesgaden National Park (IUCN-Category II) is the only German alpine national park. It borders by approximately 70 km (2/3 of its borderline) the Austrian federal state Salzburg. The Austrian - German region is also established as EuRegio Salzburg / Berchtesgadener Land / Traunstein. Figure 1 shows locality, regional context and bordering situation of the Berchtesgaden National Park and its surroundings.

In general, tourism and recreation are significant aspects in the region. Since the year 1880 the area can be characterized as a traditional holiday location. Consequently, recreation is also of major concern for the Berchtesgaden National Park. But right now the description and evaluation of recreational use inside the park is only based on little information (see Hennig & Laube 2005) and some (estimated) visitor numbers. For instance in 2002, the visitor number per year was calculated by chargeable public parkings located outside the park area and maintained by the municipalities bordering the protected area. The thus gained visitor number refers to about 1.2 million people per year visiting the Berchtesgaden National Park. Beside this number, there exists neither quantitative nor temporal (e.g. dependency on daytime or season, duration) or spatial (e.g. spatial distribution in the park

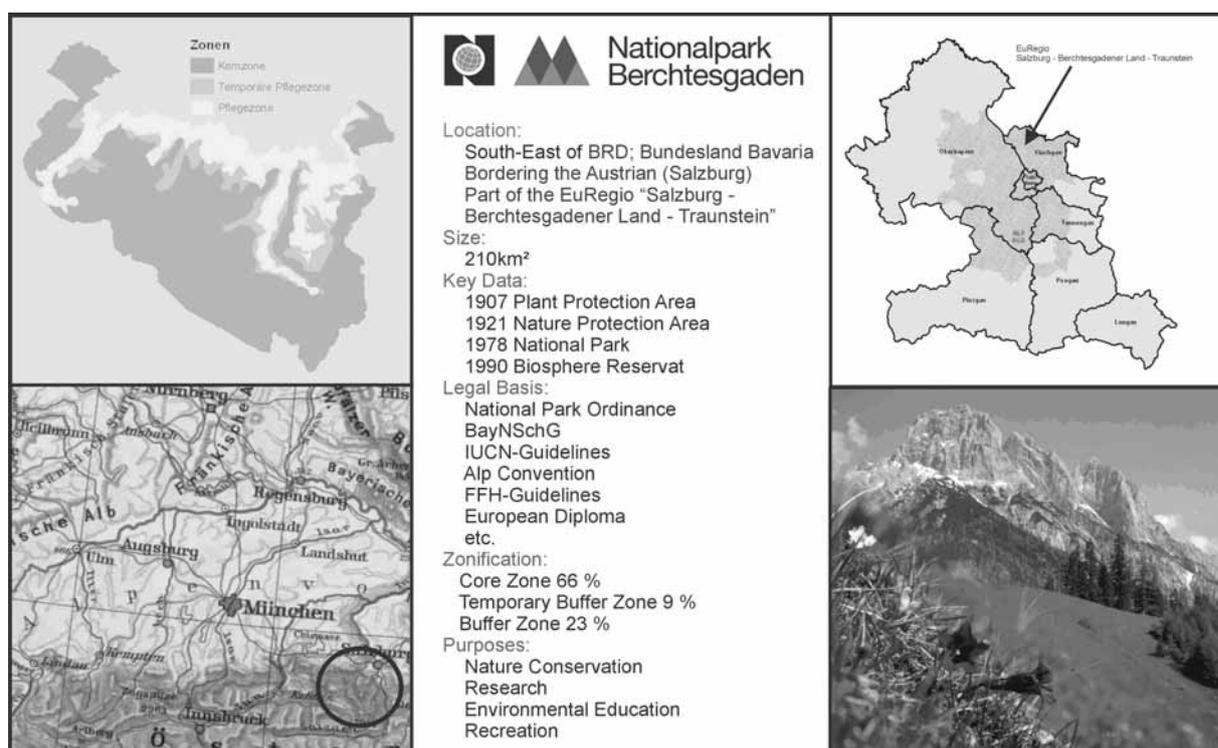


Figure 1: EuRegional Recreational Area Berchtesgaden National Park / Salzburger Kalkhochalpen.

area) information according to distinct recreation activities within the park area. Moreover visitors entering the German protected area from Austria are at present not registered at all. Even though infrastructure is an essential element to carry out the different forms of activity, except for some selective data about facilities sited inside the park area (e.g. trails, mountain huts), no data about infrastructure is available, especially in the directly bordering Austrian area. Thereby, it is difficult to get a realistic assessment about the status of recreation within the park area.

To meet demands concerning the survey of recreation mentioned above, much-needed data and information is collected and made available by a monitoring system particularly designed for the Berchtesgaden National Park. This happens by the InterReg-IIIa project “EuRegional Recreational Area Berchtesgaden National Park / Salzburger Kalkhochalpen” (duration: May 2005 - December 2006).

Modelling recreational use

Usually, monitoring is defined as information or data sampling which is repeated in certain intervals of time and serves certain scientific and/or management purposes. It differs from pure observation or surveys due to its repeated and replicable character that enables comparison over time and the evaluation against a target. Definition of investigation purpose and object determines the monitoring system in proceeding and methods. The intention of the said project is to enable the persons responsible for the field of recreation within the park management to design and apply guiding principles, management concepts and measures. Hence, a fundamental understanding of nature and landscape based recreation in the Berchtesgaden National Park is essential. Besides the existing estimation of the visitor number per year this requires detailed data and information about recreation:

- What kind of summer und winter activities can be distinguished?
- How many visitors perform what kind of activity?

- Where do different activities take place?
- Which infrastructure is essential to perform the distinguished main summer and winter activities?
- What kind of infrastructure is available to guide or inform visitors?
- What kind of infrastructure categories can be distinguished in general?
- How many visitors use the different kinds of infrastructure elements?
- Is the infrastructure supply consistent to the visitor number and their activity forms?
- By which organisations or persons is the infrastructure supported and maintained?
- Which organisations or persons promote recreation activities within the park area?
- By which organisations or persons is what kind of visitor number and information available?
- Which infrastructure located outside the national park plays an important role to enable visits to it?
- etc.

To respond to the numerous dependencies and coherencies mentioned by these questions it gets obvious that one must focus not only on visitors but on the comprehensive object for analysis “Recreation”. Therefore, it is helpful and necessary to split the object into its relevant aspects: recreational use can be described by the number of persons executing different forms of activity depending on, and therefore using the available infrastructure within the scope of a certain spatial and temporal context. Furthermore, recreation depends on specific “rules” e.g. weather dependency, personal condition, and season. Finally, recreational activities and infrastructure must always be seen in the context of organisations or persons responsible for maintenance and support. By this assumption, a model of the abstract object for analysis “Recreation” is generated. It permits us to gain insight into structures and functions of recreation. Generally, the model is based on the entirety of identified, available and collectable information, dependencies and coherencies concerning recreation. To

model “Recreation” for the case of the Berchtesgaden National Park four information-components or categories were defined (see figure 2):

1. park visitors (e.g. numbers, characteristics, activities),
2. nature- and landscape compatible activities (e.g. spatial and temporal use patterns, demands on infrastructure),
3. infrastructure (e.g. depending on activities, responsibility to stakeholders),
4. stakeholder (e.g. infrastructure, offers).

Adequate methods of monitoring must be applied in an applicable way focussing on each singular “building-block” of the model “Recreation”. Data is collected regarding to the categories’ specific elements. All data – geodata as well as attribute data - is managed by the database RDBMS Oracle-XE and the GIS ArcGIS on the basis of individually implemented database structures. In the following sections the named categories will be examined more closely.

Park visitors

A rising need for park management to know more about park visitors as key component of recreation is indisputable. Important are for example visitor number, undertaken activities, and temporal and spatial use patterns.

For the Berchtesgaden National Park visitor data is gathered by the standard methods of visitor monitoring listed for example by Muhar, Arnberger & Brandenburg (2002): cameras in combination with

time-lapse videos, personal counting and interviews etc. Data collection takes place inside and outside the park. All locations of data gathering are situated in exclusive positions characterized by its significance to recreation inside the protected area.

In addition, data related primarily to visitor numbers are available through countings by parking tickets, by ticket sales of the Jenner-Bergbahn (cable cars) and the Königssee-Schiffahrt (boat cruises) and by overnight stays at the numerous alpine huts like e.g. Carl-von-Stahlhaus, Kärlingerhaus, Watzmannhaus. Depending on the method and institution by which visitor data are collected, data are available by different levels of aggregation (e.g. time: hour, day, month, year; grouped by activity). As data management occurs by the RDBMS Oracle-XE, the differently aggregated data can be compiled and made comparable by adequate database structures (e.g. tables, constraints, views, references). Thus, it is possible to carry out statistical analysis to get a temporal overview. Further on, for a spatial survey the (statistically elaborated) data are linked to geodata representing the existing infrastructural elements using GIS.

Nature and landscape compatible activities

In the Berchtesgaden National Park only forms of activity compatible with nature and landscape are tolerated. In the mountainous environment of the “EuRegional Recreation Area Berchtesgaden National Park / Salzburger Kalkhochalpen”, the main recreational activities are

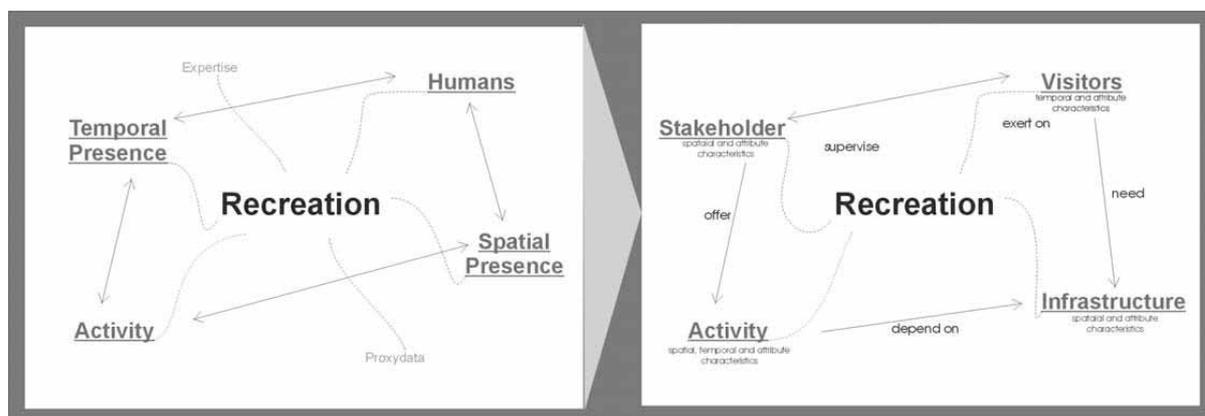


Figure 2: Aspects, components or respectively categories of the model “Recreation”.

- during the summer season: mountain biking, hiking, promenading;
- during the winter season: promenading, ski hiking, sledging and snowshoeing.

Literature research, expert interviews and observations provide insight into the forms of activity. Spatial requirements of the distinct outdoor activity focussing infrastructure, nature and landscape as well as temporal and social use patterns must be noticed. The corresponding information is included in the database linked to data of infrastructure and visitors. Especially for winter activities like ski hiking, and snowshoeing, temporal use patterns in the context of season and day-time are important (core-time of activities: midwinter - during noon, early spring – during morning hour) in respect e.g. to the mating-season of the grouse family.

Infrastructure

The exercise of nature and landscape based recreation activities requires infrastructure. Only through infrastructure can recreation activities take place. Therefore, identification and characterisation of such elements is an important aspect to survey recreation. At present ten classes of infrastructural elements are defined for the study area:

- parking lots,
- trails (for hiking, biking, ski-hiking etc.),
- bus stops,
- visitor information centres,
- mountain pastures (with food and beverage service),
- mountain huts,
- guiding elements,
- environmental education elements,
- benches, tables, picnic-supply and
- natural phenomena like lookout points, “geotope”, cascades etc.

Not only infrastructure located inside the park area is relevant. To gain insight into recreational use in the national park, infrastructure situated outside the park area must also be considered: Most hiking, biking or skiing trails start from outside the pro-

tected area. The chargeable public parking lots are all located outside the park area. In most cases they are the starting point for park visits. Therefore, both - in the national park and in the surroundings - infrastructure elements get mapped by GPS and by the use of digital aerial photographs. The surveyed spatial data is managed by GIS (ArcGIS) together with the spatial dependencies between the infrastructure elements: e.g. parking as starting point of a trail; huts as end points of trails, information elements accompanying a trail. Relevant attributes to the different infrastructure elements in context with recreation activities (biking, skiing, hiking, snowshoeing etc.), the demands of usage (e.g. duration, weather, condition, opening time), the organisation responsible for maintenance (e.g. public parkings by municipalities, trails by alpine associations or the park administration) are managed by a database (RDBMS Oracle-XE). To handle the data accordingly a particularly database structure was designed. Visitor numbers and characteristics are - after being elaborated statistically - linked to the infrastructure elements.

Stakeholders

Besides the state park administration, regional and local aspects affect the park area. Therefore, local and regional stakeholders are of importance: As mentioned before, stakeholders support and maintain infrastructure inside as well as outside the park. Also, numerous and various data and information relevant to tourism and recreation within the study area are available by different stakeholders (e.g. municipalities, alpine associations, and tourism agencies). But unfortunately, co-operation between individual stakeholders (including although the park administration) as well as communication or exchange regarding data and information, barely exist.

Following regional planning, land use planning, tourism concepts, nature conservation strategies etc. all stakeholders within the region and with relevance for recreational use in the park are identified and characterised. Their contact-information, field of activity (e.g. tourist offers, infrastructure), availability of visitor data (mainly visitor numbers), their (hierarchical) organisation and dependencies as well as their spatial activity area (e.g.

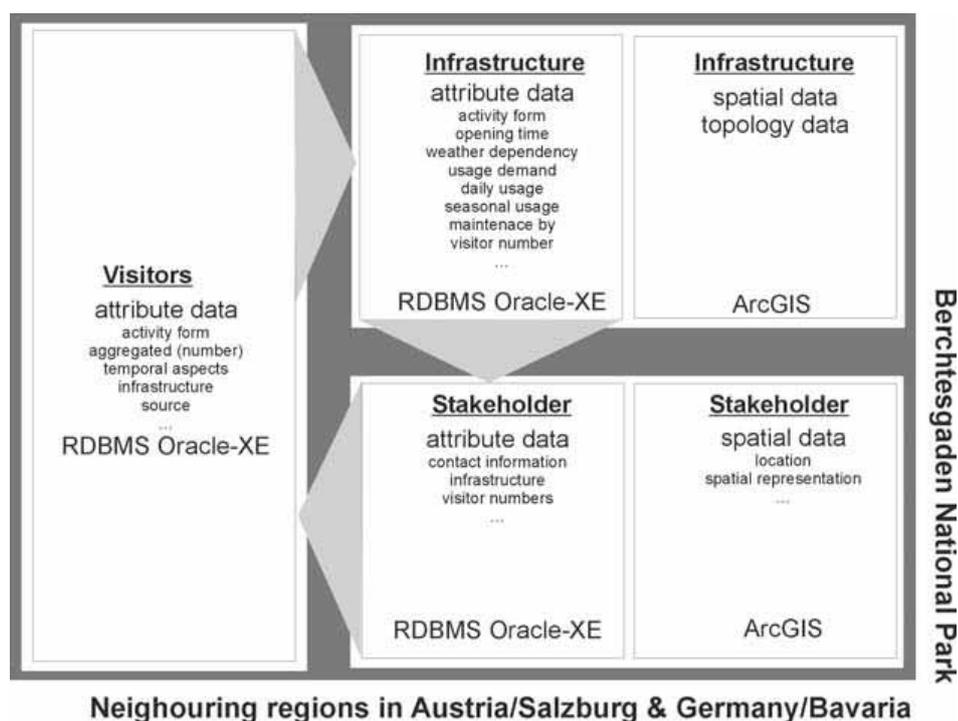


Figure 3: General database conception.

municipal area, planning area) etc. is held by particular tables in the database RDBMS Oracle-XE and GIS (ArcGIS).

Figure 3 illustrates the general conception of the (computer-based) integration of data and information according to the four “building-blocks” and categories of the model “Recreation” visitors, infrastructure, activities, and stakeholder.

Conclusion and future prospects

Monitoring of recreation is more comprehensive than visitor monitoring and is more suitable to fulfil the present needs concerning the management of recreation within national parks. The combination of data according to visitors, infrastructure, activity forms, and stakeholders, its consequent ongoing observation as well as progressive data input in database and GIS provides a good basis for sustainable management measures. As nearby areas generally influence protected areas by their recreational offers, infrastructure elements, and as a source of visitors - being residents or being tourists - entering the park for recreational reasons, growing demand on data and information concerning the neighbouring area is evident. The comprehen-

sion of a national park region instead of the separately treated, island-like national park is essential - particularly in Central Europe. Therefore, one intention of monitoring is to gain a sustainable and boundless awareness in this German-Austrian recreational area. By the combination and analysis of different spatial and attribute data (e.g. social networks, spatial analysis methods etc.) for the Berchtesgaden National Park and the bordering area this can lead to a zoning of the surroundings. The adjacent land can be categorized by its importance to the field of recreation succeeding in the park area. It is therefore important, as monitoring activities concern the protected area and its surroundings, that management measures also regard the park area and the adjacent lands. In consequence, population, stakeholder and park administration should agree on discussions and co-operation on management solutions – following the monitoring results. But particularly in Europe an exigency to integrate protected areas into larger scopes exists. All too often protected areas are regarded as something apart from the adjacent land and the bordering regions. Nevertheless, especially in context of recreation, national parks cannot be seen separately from the surroundings (compare Hannemann & Job 2003).

Due to the border situation with Austria and the prospect of an Austrian nature park neighbouring the Berchtesgaden National Park, to be established in 2006, the demand for a monitoring system crossing the park borders is even more evident. This gets strengthened by the guiding principles of the EuRegio Salzburg / Berchtesgadener Land / Traunstein which the Berchtesgaden National Park and its surroundings are part of. Generally, in Central Europe research on protected areas in bordering situation is an important issue. Investigations are urgently needed for borderland protected areas. Activities in this field are poorly established, but they must increase. A good possibility of approach concerning this problem can be seen in this ongoing project and its focus on the border situation of the Berchtesgaden National Park.

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