

Managing emerging patterns of outdoor recreation - The example of Nockberge Biosphere Reserve, Austria

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Changing patterns of recreational uses

The COVID-19 pandemic has revealed multiple aspects of human-nature interactions and relationships. In protected areas, for example, the significantly reduced or altered visitor frequencies of the "anthropopause" (Rutz et al., 2020, p. 1156) have opened up the possibility of observing the influence of tourism and visitor behaviour on wildlife. Yet, the pandemic has increased the pressure on many natural sites and protected areas. An inquiry on European protected areas identifies "overcrowding, a new profile of visitors, problematic behavior, and conflicts between different user groups" (McGinlay et al., 2020, p. 1) as corresponding problems. This gives measures for the precautionary proactive management of visitor flows and tourism activities a new relevance.

Protected areas are confronted with the inherent aporetic conflict (Jungmeier et al., 2016) of, on the one hand, enabling the guest to maximise nature appreciation and experience, and, on the other hand, protecting species and habitats from the negative impacts of visitor pressure (Leung et al., 2018). This has given rise to a number of scientific findings (e.g. Arlettaz et al., 2013; Jaeger et al., 2020; Ingold and Blankenhorn, 2005). In addition to a general increase in visitor numbers, new patterns of movement beyond traditional hiking trails (e.g. mountain biking, downhill, backcountry skiing, paragliding, etc.) are leading to a broad distribution and ephemeral appearance of visitors in protected areas. Through social media, new points of attraction, routes or activities are emerging, over which the management of protected areas can exert diminishing influence. Reaction times have shortened and selective overtourism at specific hotspots is increasingly becoming a problem ("instagram-tourism").

The management of visitor flows, especially in iconic landscapes, must respond to these challenges. In our contribution, we would like to use the example of visitor management in the Nockberge Biosphere Reserve (BR) to work out the associated possibilities, limits and challenges.

Participative development of solutions

With an area of 149,000 ha, the Salzburger Lungau & Kärntner Nockberge BR is the largest BR in Austria. The BR is located in two federal states. The Carinthian Nockberge part was originally designated as a national park but was reclassified as a BR because of its rural cultural landscapes.

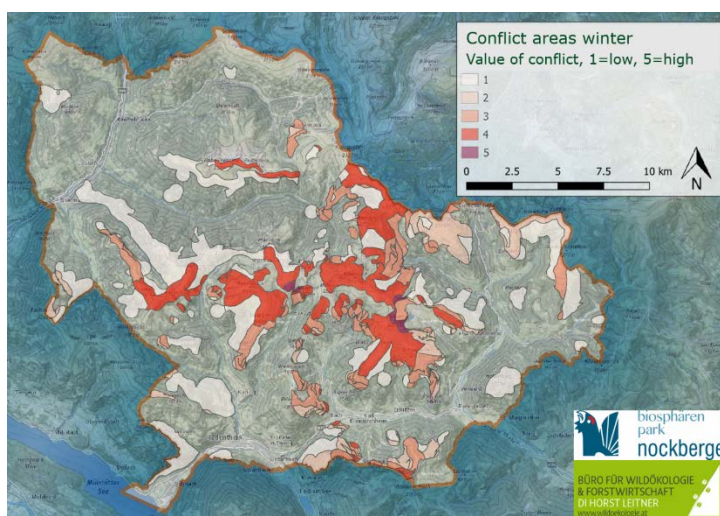
The Nockberge mountains are embedded in an attractive tourist region that offers a wide range of activities for all seasons.

Some of the tourism opportunities are developed and implemented by the BR itself. These include thematic trails, visitor information points and exhibitions, and educational programmes ranging from guided winter snowshoeing excursions to webinars about different topics and school programmes for students of different ages. Many possibilities in the park are also open to individual tourists, such as the scenic Nockalm Road, hiking trails and touring routes. These are used by motorised guests (cars, motorcycles), hikers, cyclists, ski tourers and other sportspersons. In this context, problems repeatedly arise not only with sensitive areas and nature conservation requirements, but also with hunting interests and landowners.

Within the framework of a large-scale study (Leitner et al., 2019), the areas of conflict between nature conservation, hunting and outdoor recreation were identified, discussed and resolved with broad consensus among the different stakeholders. In the sense of evidence-based management, the scientific facts were first collected and established beyond dispute. The most important stakeholder groups were already involved in the collection and preparation of the most critical facts.

The project started with four major informational events to inform the people of the BR about the main contents of the project. Data on outdoor activities were collected via interviews, maps and online providers. The combined knowledge of wildlife ecology by both local hunters and experts was used to determine the core habitats of six umbrella species (*Cervus elaphus*, *Rupicapra rupicapra*, *Tetrao urogallus*, *Tetrao tetrix*, *Lagopus muta*, *Alectoris graeca*).

The overlaps of areas used for recreation with core wildlife habitats revealed so-called conflict-areas (Map 1). Based on factors including the conservation status of the area and wildlife, the number of affected species and intensity of recreational activities, the potential of conflict was distinguished within each area. This zonal classification of potential conflict forms the basis and starting point for future measures for nature conservation and the protection of the local natural heritage.



Map 1: Different values of conflict in the Kärntner Nockberge Biosphere Reserve in wintertime. As part of the GIS analysis, touristic uses in summer and winter were spatially recorded and overlaid with the habitats of sensitive species. The resulting conflict map shows the areas with a particular need for action.

Conclusions and perspectives

Biosphere reserves are, according to UNESCO definitions, "learning places for sustainable development"(www.unesco.org/biosphere)and therefore carry unique challenges to develop appropriate management measures. According to the concept of a BR, these measures should be elaborated and developed in participatory coordination with the users and interests involved (Egner et al., 2017). In the described project, BR is central to the emotional triangle of nature conservation - hunting - tourism. In this context, evidence-based action and the insights of involved stakeholders shall lead to long-term solutions that are successful without and beyond external measures.

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