

## Census and monitoring of bird species in the National Park Gesäuse, Austria

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### Summary

Since 2004 the National Park Gesäuse GmbH runs extensive surveys of (a) species that depend on old forests or deadwood as indicators for habitat management and (b) indicator species for optimising visitor management.

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### Keywords

birds, monitoring, visitor management, habitat management, tetraonids, woodpeckers, golden eagle, Natura 2000, indicator species, stress hormones

### Aims of the study

The Gesäuse is designated as both IUCN category II National Park and Natura 2000 site. These protection categories pursue different objectives and priorities concerning species protection, habitat management and leisure time activities. Therefore, data on the distribution, abundance and habitat requirements of indicator species are essential for management measures.

### Area of study

The National Park Gesäuse with an area of 11,054 hectares is located in the Ennstaler Alpen, which are part of the North eastern Limestone Alps in Austria. 86 % is designated 'Protection Zone', where the virgin landscape is subject to nature protection. The rest is the so-called 'Management Zone'.

### Methods

#### Species that depend on old forests or deadwood as indicators for habitat management

In 2004 and 2005 surveys of capercaillie (*Tetrao urogallus*) were conducted in 3 areas according to the habitat suitability index (STORCH 1999, HAUBENWALLNER 2006). Since 2006 woodpeckers have been surveyed within a LIFE project using stimulation by tape recorded songs.

#### Indicator species for optimising visitor management

Due to strongly increasing numbers of winter visitors in the last years additional winter surveys of capercaillie and black grouse (*T. tetrix*) and estimations of habitat suitability in context with skiing activities were realized (GRÜNSACHNER-BERGER & PFEIFER 2005, 2006).

As a pilot-project we attempted to estimate the influence of human disturbance by measuring stress hormone (corticosterone) metabolites (CORT) from capercaillie droppings (THIEL et al. 2005, 2008, HIRSCHENHAUSER & GRÜNSACHNER-BERGER 2008). Droppings were collected in February 2008 in the National Park and in 4 control areas. To avoid type I error due to pooling fallacy we determined individual genotypes from each dropping (SEGELBACHER et al. 2008).

During summer the Gesäuse is frequently used for climbing, which may interfere with golden eagle (*Aquila chryaetos*) breeding activities. Yearly controls of golden eagle pairs in the National Park and in the adjacent regions have been continued since 2005 in collaboration with Slovakian specialists.

Human summer activities are also concentrated around the river, e.g. rafting. Since 2003 abundance and success of common sandpiper (*Actitis hypoleucos*) breeding pairs have been surveyed along the river Enns. In 2006 we collected detailed observations of behaviour and breeding activities using standard protocols (HAMMER 2006).

Results

Species that depend on old forests or deadwood as indicators for habitat management

Within the park two areas allowed a comparison of habitat suitability for capercaillie. The habitat suitability index (HSI) showed a low suitability for capercaillie in the northern part in Gstatterboden (year = 0.3), mainly caused by the structure of forests with a high portion of artificial, young spruce forests and the lack of blueberry (*Vaccinium myrtillus*). In comparison, Johnsbach in the south with natural acidophilous spruce forest and high canopy density of blueberry shows better HSIs (year = 0.5).

6 woodpecker species could be found in Gstatterboden (700 ha), but density is also very low, due to these monotone spruce forests, e.g. three-toed woodpecker (*Picoides tridactylus*) is found only with 1 – 2 pairs. First changes may be observed in the increasing number of white-backed woodpecker (*Dendrocopos leucotos*) with 3 territories in 2009, which benefits from windbreakings in beech forest patches near the tree-line.

Indicator species for optimising visitor management

In the southern part of the National Park at Gscheideggkogel capercaillie habitats of good to very good quality are frequently used by ski mountaineering (#Figure 1). The area around the top was also classified as very good habitat for black grouse. Also in Zirbengarten an overlapping of very good habitat for black grouse and intensive skiing activities is found over 100 ha. This fact carries potential conflicts with much disturbance for both species.

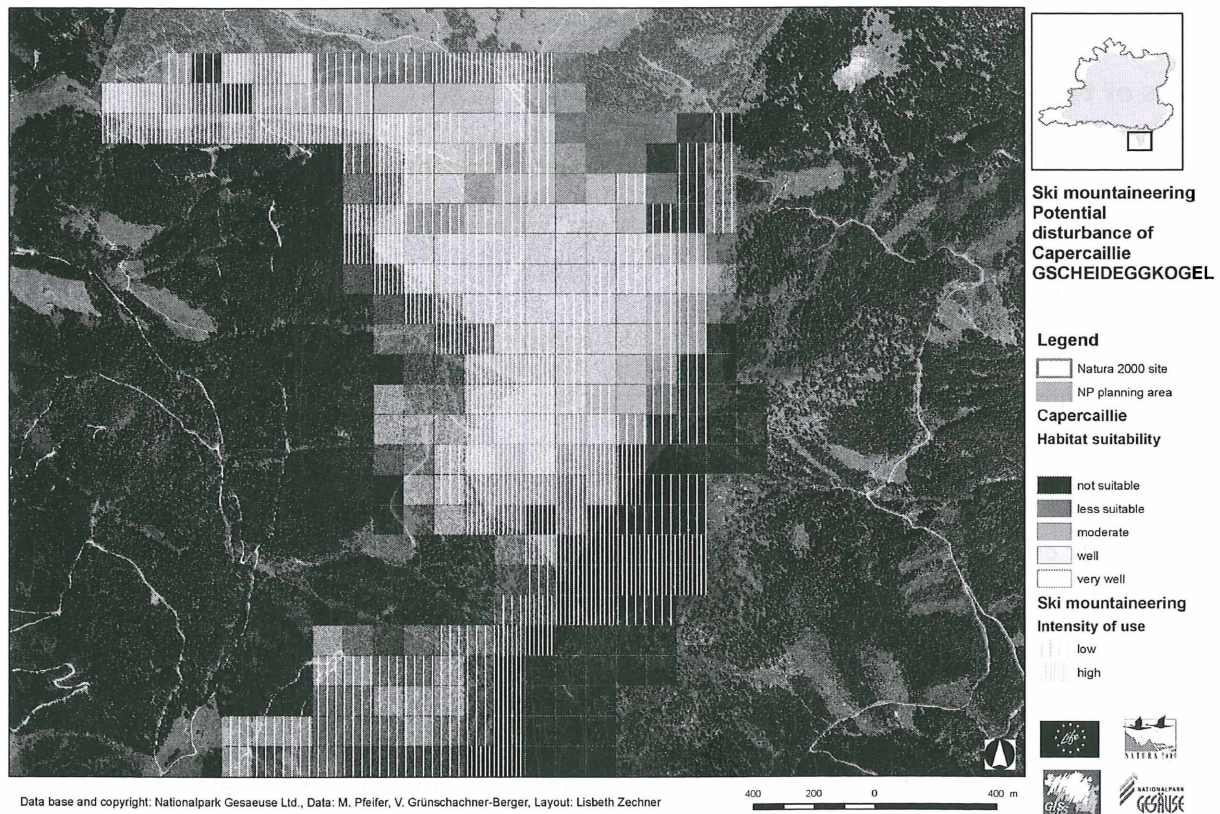


Figure 1: Habitat quality for capercaillie and intensity of ski mountaineering at the Gscheideggkogel

However, the analysis of excreted stress hormone metabolites resulted in unexpected patterns: lowest CORT levels were found in droppings from the most disturbed study area in the National Park. A number of potential parameters may explain this result and new questions have come up. For example, do capercaillie habituate to predictable or frequent disturbances (#Figure 2), and how much of this variation is explained by food and snow cover?



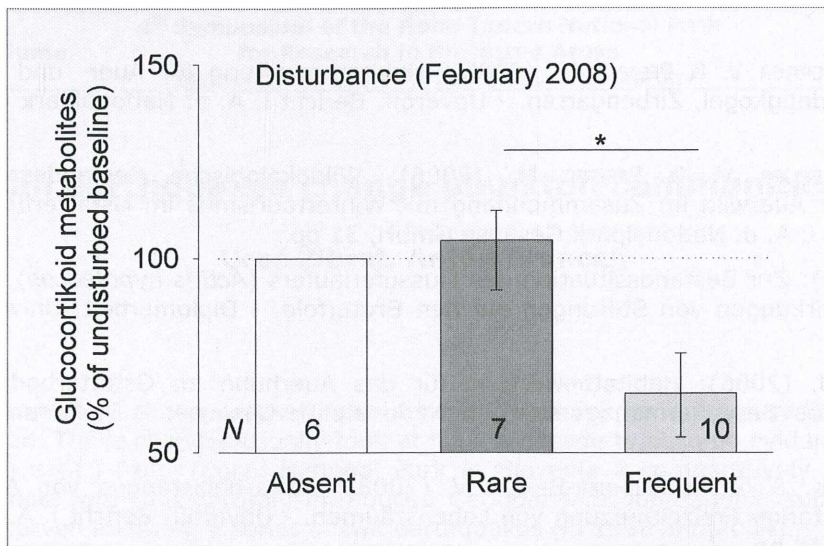


Figure 2: Stress hormone metabolites from droppings of male capercaillie in areas with different degrees of human disturbance: undisturbed ('Absent'), occasional wood works ('Rare') and ski trail at Gscheidegg ('Frequent')

During summer, disturbances may be more severe for golden eagles. Breeding success of the 3 pairs in the National Park was quite low. 2005 – 2009 only 2 juveniles fledged successfully (mean reproduction rate 0.13 juveniles/pair and year). In 2008 one juvenile (observed by an installed camera) died just some days before fledging because of bad conditions with cold, rainy weather and lack of prey. Disturbance by helicopter flights might be an additional problem for one pair.

A similar situation was observed for common sandpiper. We could only reconfirm 2 – 4 breeding pairs in the National Park and 1 – 2 additional pairs in adjacent sections of the Enns. The pairs are distributed in the broader sections of the river with shallow banks. Closed high canopy vegetation (median 50 %) mainly of bushes and trees < 5 m is typical. In 2004 we registered 382 boats. Common sandpipers were more disturbed by noisy visitors than by silent ones. Also the distance between birds and boats was elementary. In one case a breeding pair abandoned their nest assumingly due to frequent human disturbances.

## Discussion

All monitoring activities in the National Park are related to concrete management activities, i.e. aiming at the optimisation of visitor and habitat management measures. For cliff breeding species (i.e. golden eagle) nest protection zones with restrictions were defined within the Natura 2000 site. Along the river Enns first consequences comprise marked entry and exit sites for rafters, information panels and folders, annual training of rafting guides and ranger guardians. At the starting points of ski mountaineering routes information panels have been installed to reduce negative impact of skiing activities in the core areas of capercaillie and black grouse. The routes and trails have been marked in sensitive areas and an alternative route was found to calm the Zirbengarten. Additionally, a folder with recommended routes was printed. Unfortunately, acceptance of these actions by visitors and locals is not satisfying.

First actions were taken within the forest management to improve the habitat quality for capercaillie. The habitat quality for woodpeckers, owls and red-breasted flycatcher (*Ficedula parva*) may be ameliorated by enhancement of deciduous forests and of natural succession with more dead wood and older stands. In fact, measures taken to avoid bark beetle calamities are counterproductive to enforce these processes.

Using long-term census of selected bird species we demonstrate that continuity and improvement of monitoring activities are important to estimate habitat quality, particularly the impact of habitat and visitor management. Our aim is the adjustment of these surveys with Natura 2000 monitoring guidelines, and the cooperation with other protected areas to standardise methods and compare the resulting directives for wildlife management.

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