

## Abundance and habitat selection of two alpine songbird species in the National Park Hohe Tauern (Austria)

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### Abstract

Scientific research and management measures in protection areas often focus on rare and endangered species. In terms of financial resources and manpower this approach is reasonable in a short-term aspect. But long-term developments and processes often require formerly common and widespread species for calibration, as shown by the influence of climate change in the Swiss Alps on an alpine breeding grouse species. And birds in general are well adapted organisms in different ecosystems to indicate ecological conditions or their shift.

In the Austrian Alps, even in mountainous protection areas, knowledge about most of the common breeding bird species is rare. In the National Park Hohe Tauern in the Provinces of Kärnten and Salzburg, an ornithological project dealing with grouse, woodpeckers and owls listed in the Annex I of the European Birds' Directive was carried out from 2010 to 2012. Aside from the sometimes rare target species, some common and widespread passerines were quantitatively censused by territory mapping, too. Among them, we chose two characteristic species breeding in the alpine zone above tree line, both representing somewhat different habitat preferences regarding vegetation cover and scree to rock boulder cover, namely Water Pipit (*Anthus spinoletta*) and Wheatear (*Oenanthe oenanthe*). We present quantitative results from more than 10 different plots (each c 90 to 150 ha) to the north and south of the main chain of the Alps. Breeding abundance of both species can serve as a data baseline for future climate change research. We discuss habitat selection or preferences of both species.

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### Keywords

National Park Hohe Tauern, breeding birds, territory mapping, habitat selection, *Anthus spinoletta*, *Oenanthe oenanthe*

### Introduction

In remote and often hardly accessible habitats like mountainous areas, knowledge about distribution and abundance even of widely distributed and common breeding bird species is rare. This means, that actual population size is roughly estimated for species concentrating their breeding area in these habitats. As a consequence, changes of distribution or population size triggered by altering ecological conditions are easily overlooked. Furthermore, the study should serve as a baseline for future monitoring and research on climate change in a large protection area of the eastern Alps.

### Methods

The study site covered the National Park Hohe Tauern in Kärnten and Salzburg with a total area of c. 1.246 km<sup>2</sup> ha. It's situated in the highest part of the eastern Alps in Austria reaching from about 1000 to 3798 m at the summit of Großglockner, Austria's highest mountain. The mountains of the Hohe Tauern are buildt by plutonic rocks and characterized by steep slopes, large glaciers and rather large alpine valleys with currents with high water-carriage during the spring and early summer melting period.

In total c. 15.000 ha spread over 103 reference plots with a mean area of c. 150 ha were covered by territory mapping following BIBBY et al. (1995) and SÜDBECK et al. (2005) with three visits per season. About 60 of these plots were situated around or above treeline and therefore with basically suitable habitat for Water Pipit and Wheatear. Location of the reference areas was originally selected by habitat modeling for two main-target species of the study (FRÜHAUF et al. 2013), namely Rock Ptarmigan (*Lagopus muta*) and Rock Partridge (*Alectoris graeca*).

Simultaneous registrations were marked separately in order to determine maximum territory numbers following TOMIALOJC (1980). Mapping was done by 5 different field workers, territory analysis was made by only one experienced ornithologist.

Two widespread songbird species (Water Pipit, Wheatear) of the alpine zone were chosen for this presentation. Both species are characteristic for alpine meadows at and above treeline and are limited by bare rock faces and scree fields without vegetation formerly covered by glaciers. Both species are migrants that arrive rather late in the season on their high breeding grounds in central Europe. The Water Pipit with its wintering areas around the Mediterranean Sea arrives first, but is often forced to repeated altitudinal migrations by late snowfalls in April, so the main breeding season for both species reaches from May to mid July.

## Results

Both species show similar maximum abundances of 0,37 and 0,43 territories/10 ha for Water Pipit and Wheatear, respectively. Though, using the same habitat and occurring regularly in the same reference plots, the two species show some differences in habitat preference. The Wheatear tolerates higher coverage of scree and rock boulders and avoids rather uniform alpine meadows dominated by a few grass species. The Water Pipit prefers weakly structured alpine meadows, often interspersed with scree; the species is often found near tiny streams or moist ground conditions. Both species tolerate a quite low coverage of dwarf bushes (*Rhododendron ferrugineum*, *Juniperus communis*).

## Discussion

Variations of species' abundance and habitat preferences are discussed in the presentation.

## Conclusion

The presentation gives to our knowledge the first large-scale breeding census of the Water Pipit and the Wheatear in the National Park Hohe Tauern, some older census works were done on comparatively small plots that were furthermore geographically concentrated. The results should serve as a baseline (I) for future common breeding bird monitoring in the National Park and (II) and for climate change research in an alpine area, where global warming is known to go forward in an outstanding intensity (CAMENZIND 2012).

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