

## Biodiversity assessment in the Gesäuse National Park

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### Abstract

We assessed the biodiversity database of the Gesäuse National Park and have now evidence of 7,216 taxa present in the last two decades. So far for Austria the first record of at least 114 new species was taken, 7 completely new species discovered and 75 endemic species detected.

### Keywords

biodiversity, national park, Gesäuse, database

### Introduction

The Gesäuse National Park, Austria's youngest national park, was established in 2002. The protected area covers 113 km<sup>2</sup> and is characterized by its main habitats of rock, alpine meadows, forests and waters. High relief intensity shapes the scenery reaching from 490 m (river Enns at Hieflau) up to an altitude of 2,369 m (Hochtor). The rugged peaks are made of Dachstein limestone and Ramsau dolomite. The comparatively fast weathering of the dolomite rocks creates extensive debris flows and the steep slopes cause a high rate of dynamic natural processes such as avalanches and landslides (MARINGER & KREINER 2016). Situated on the edge of the Alpine glacial shield during the last ice age, the Gesäuse region has retained a particularly high number of 143 endemic species (RABITSCH & ESSL 2009).

Identification and monitoring of species and species richness is a key issue to the national park's management. It is a vital necessity when it comes to implementation of strategies, policies and actions. After 15 years of comprehensive research efforts we established an architecture to efficiently analyse and utilize the data gained so far.

### Methods

By summer 2017 approximately 200,000 records were stored in a Microsoft SQL database and maintained by the BioOffice 2.0.8 frontend (Biogis Consulting 2004). We assume that 80 % of the research results are included up to now, representing 270 research reports, monitoring results (KREINER & MARINGER 2017) and casual observations. In order to illustrate biodiversity at this point in time, we chose the cutoff date to be 31.12.1989. Within the national park's area of 113 km<sup>2</sup> we analysed 148,427 records. By definition, we counted taxonomically valid species as well as all taxa (such as species, subspecies, varieties, hybrids) as entered in the database. To the best of our knowledge, synonyms were excluded following the Pan-European Species Directories Infrastructure (PESI 2017) and expert assessments.

### Results

Tab. 1 depicts 7,216 taxa present in the Gesäuse national park at the very moment and at least recorded once since the beginning of 1990. The numbers of the main taxa reasonably match the main findings of research (Spermatophyta & Pteridophyta: GREIMLER (1997), ZIMMERMANN & KREINER (2017), KERSCHBAUMSTEINER et al. (2012); Bryophyta: SUANJAK (2012); Lichens: WILFLING (2012); Fungi: POCK (2012); Mammalia: MARINGER 2012, PYSARCZUK (2009); Aves: MARINGER et al. 2017; Pisces: GUMPINGER (2017); Amphibia & Reptilia: MARINGER & REMSCHAK (2017); Insecta: FRIEB (2012), HABELER (in prep.), HOLZINGER (2012), ZECHNER (2012); Arachnida: KOMPOSCH (2012); Gastropoda: ARIANTA I-V WORKSHOPS (unpub. data), VOLKMER & KOMPOSCH (2015). Accepting various taxonomic disputes, we count 6,520 species in the Gesäuse national park so far. This represents the most recent state of knowledge and is not an estimation of overall biodiversity. For hard facts concerning specific taxonomic groups the citation given should be reviewed and referenced.

Some of these species were newly discovered such as *Leuctra astridae* GRAF 2005, *Leptosciarella gretae* HELLER 2012, *Camptochaeta austriaca* HELLER 2012, *Bradysia kirstenae* HELLER 2012, *B. fontinalis* HELLER 2012, *Hemerodromia strobli* WAGNER & GERECKE 2008, *Halacarellus fontinalis* BARTSCH & GERECKE 2011. For Austria the first record of at least 114 new species was taken in the Gesäuse region KREINER & MARINGER (2012).

In this period we verified the presence of 24 endemic plants and 51 endemic animals. This list is incomplete due to new findings by KOMPOSCH et al. (2015, in prep.) during their work on Coleoptera (Curculionidae, Chrysomelidae, Staphylinidae), Diplura, Arachnida (Palpigradi, Pseudoscorpiones), which started in 2015 and is not finished yet.

<b>Taxonomic Group</b>	<b>Taxa</b>	<b>Species*</b>
Plantae	1.223	1.015
Bryophyta	329	281
Lichen	519	477
Fungi	637	617
Mammalia	65	48
Aves	122	121
Pisces	15	14
Crustacea	64	60
Amphibia & Reptilia	13	13
Arachnida	456	364
Gastropoda	115	76
Lepidoptera	1.234	1.234
Hemiptera	458	436
Coleoptera	684	646
Diptera	730	632
Hymenoptera	271	246
Orthoptera	33	30
Trichoptera	85	72
Ephemeroptera	18	11
Plecoptera	65	57
Odonata	17	17
Various Taxa	63	53
	7.216	6.520

Table 1: Biological diversity found in the Gesäuse National Park (1990-2017). Area assessed: 113 km<sup>2</sup>. \*) see text for definition.

## Discussion

Choosing a cutoff date led to a loss of 15,974 older records (10.8 %). Nevertheless, this fits into the park's history when the first research studies were commissioned in the early 1990ies during the foundation phase.

Some of the data may be biased either because of misidentification of taxa by the responsible scientists, due to taxonomic unsteadiness and changes, or to deficiencies during data handling. However, this is the first attempt to merge almost all of the records that have ever been entered into the BioOffice 2.0.8 database for the Gesäuse national park.

Monitoring focuses on indicator species from the orders of Orchidacea, Hemiptera, Orthoptera, Arachnida and Aves as well as on species of the European Union's habitat directive and birds directive (Council Directives 92/43/EEC and 2009/147/EC). Thus, sufficient data for these taxa is available. So far unknown numbers of species are red listed for Austria or the federal province of Styria. This issue can be addressed by implementing digital lists of endangered species.

We are working on data refinement as well as on the integration of incoming and old data sources. A project realised by Nationalparks Austria members is currently dedicated to making Austria's national parks' biodiversity data available online. The results can potentially be matched with GBIF (Global Biodiversity Information Facility) databases or other projects. A first insight into the taxa presented here is given in GERECKE et al. (2012) and KREINER & MARINGER (2012). Peer reviewed papers and research reports commissioned by the Gesäuse national park can be found on [www.parc.at](http://www.parc.at) or [www.nationalpark.co.at/forschung](http://www.nationalpark.co.at/forschung).

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