

# 20 years later... Investigating temporal dynamics of ground-beetles (Coleoptera: Carabidae) in lowland beech forests

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## Background

From 1999 to 2001 a BfN-funded study investigated how the management of beech forests can be optimized in order to maintain their functionality as natural ecosystems (Winter et al. 2003). In the course of this study ground-beetles were assessed in different beech forests across Brandenburg and Mecklenburg-West Pommern.

Now, 20 years later, we set out to re-assess ground-beetles at the original locations because we are interested in answering the following questions:

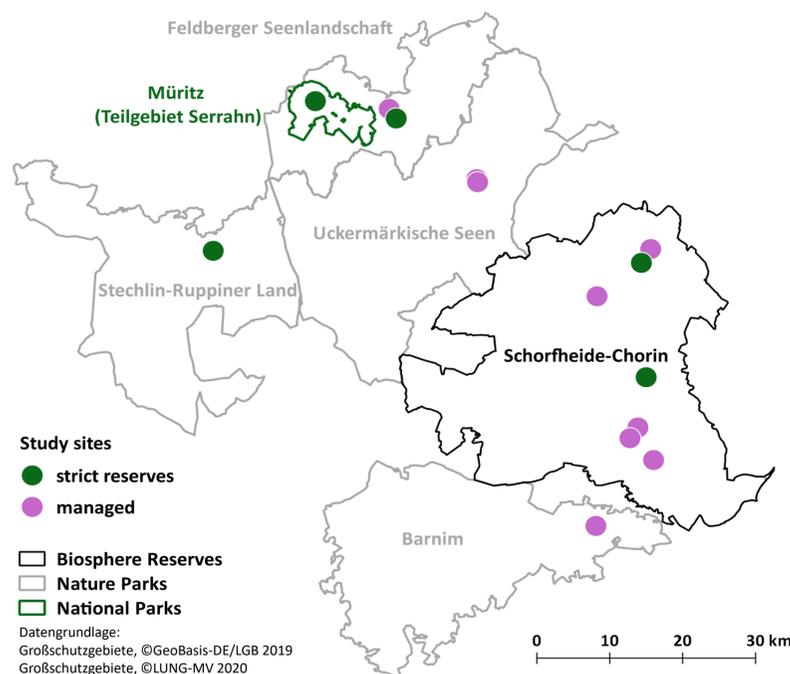
1. How did the ground-beetle community change in managed and unmanaged beech stands over the last 20 years?
2. Are ground-beetles of beech forest as affected by the insect decline as other taxa?



**Why are we interested in Ground-beetles?** They represent the top predators among the ground-dwelling arthropods. Therefore, ground-beetles are often considered as bioindicators. They are relatively easy to sample and identify. A recent study by Homburg et al. (2019) indicates that ground-beetles in forests might also be affected by the general decline of insects.

## Project details

20 years ago ground-beetles were collected at 14 sites. These include managed beech forests but also strict reserves such as parts of UNESCO World Heritage beech forests in Serrahn and Grumsin. From 2020 to 2022 we will collect ground-beetles at the exact same locations using the same type of pitfall traps. We will also survey environmental parameters such as forest structure, ground vegetation and dead wood at each trap location – information that was also already gathered during the original study.



## Scope

Both assessments – then and now – cover multiple years which will allow us to account for annual variations in population size. Having precise information on the relevant environmental parameters for each plot – again, then and now – will enable us to consider site-specific developments of the ground-beetle community. Both is crucial for disentangling the true long-term trends. Here, we are not only interested whether the mere number of ground-beetles have changed. Temporal dynamics can affect insect communities in various ways, such as:

- Number of species
- Biomass
- Ecological traits
- Number of individuals
- Species composition

