

## Linking habitat dynamics and population cycles of small mammals in different mountainous forest types in Austria

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### Keywords

small mammals, seed rain, habitat dynamics, population cycles, old-growth forests, long-term monitoring

### Summary

Scientific research in protected areas such as the Wilderness Area Dürrenstein (WAD) is of particular importance to gain a better understanding of ecological relationships in the absence of human influences (LANG & NOPP-MAYR 2012). Within the WAD occur about 400 ha of primary old-growth forests constituting an optimal reference area to compare with other forest types (LEDITZNIG 2013). According to the protection status of the area as a strict nature reserve (IUCN category Ia) one of the management aims is to give free rein to ecological processes (process protection) including natural disturbances, such as windthrows and avalanches (LEDITZNIG 2013). Those events of natural disturbance led to early stages of forest succession resulting in different species composition and abundance patterns of small mammals and other taxa. Our study focuses on the relationship between small mammal activity and seed rain of mast-seeding trees in the light of different forest types. We conducted live trapping of small mammals since 2002. We commenced with two study areas and included further areas in subsequent years. Currently we are working on 5 different study areas. Two sites of natural disturbance (avalanche: AV; uncleared windthrow: WT); two sites in primary old-growth forests (POF1, POF2) and one site in a managed forest (MF). Live trapping of small mammals was done on a 15 x 15 m grid with two traps per grid point. On study areas POF1, POF2, MF and WT we installed 50 traps on a square grid. On AV 88 traps were placed on an elongated rectangular grid. We used different combinations of traps, exploring differences in trapability (wooden box traps, Ehlert & Partner, Niederkassel-Rheidt, NRW, Germany; plastic traps: FIELD TRIP TRAP Alana Ecology, Bishop's Castle, Shropshire, GB and TUBE TRAP MKI BioEcoSS Ltd., Bridgnorth, Shropshire, GB; Sherman traps, H.B. Sherman traps, Tallahassee, Florida, USA). In most years trapping was carried out twice a year in June and August for 2-5 consecutive nights. Individuals of *Apodemus* sp. and *Myodes glareolus* were unambiguously marked. We recorded morphometric parameters and released all individuals at the point of capture. We further measured seed rain of the most common tree species (European beech *Fagus sylvatica*, Norway spruce *Picea abies* and silver fir *Abies alba*) within POF1 and POF2 since 2003. Therefore 81 seed traps were installed on a 1 ha square grid on each location. Seeds within the traps were counted twice a year. Mean number of available beechnuts/m<sup>2</sup> significantly correlated with overall capture success of small mammals per year ( $r_s = 0.62$ ,  $p = 0.028$ ). We detected 3 population peaks of *Apodemus* sp. and *Myodes glareolus* in 2004, 2008 and 2012. Further investigations will be conducted to discover driving factors for small mammal abundance in different forest types (see poster).

### References

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