



Czech University of Life Sciences Prague

Faculty of Environmental Sciences

RESEARCH INTO AVIAN POPULATIONS AND COMMUNITIES AND THEIR USE IN THE PROTECTION OF HUMAN-ALTERED LANDSCAPE

Team introduction:

The modern landscape is strongly influenced by various human activities resulting in extensive exploitation of natural resources at the expense of biodiversity loss. This leads to the need to search for trade-offs between sustained use of natural resources and biodiversity conservation. Knowledge of community structure and of risks due to habitat management and species' population attributes indicating environmental changes may be important for the sustainability of both natural resources use and bird richness patterns (species composition, diversity, rarity in different types of habitats). Our research team has long-term experience with research in three main topics:

1. Landscape influenced by agriculture – our studies are focused on population dynamics, habitat requirements, breeding biology, survival and mortality causes including predation in populations of two model species with different habitat requirements: the northern lapwing (*Vanellus vanellus*; need for wetlands and moist habitats) and the grey partridge (*Perdix perdix*; need for habitat heterogeneity).
2. Post-industrial and post-mining landscape – our studies concentrate on avian community structure and associated effects of predation risks, vegetation structure and management history (e.g., spontaneous natural development versus conventional technical reclamation) throughout succession series from postdisturbance stands to mature forests.
3. Secondary production forests – we are concerned with the bird richness patterns in these forests and the responsible management approaches including forest fragmentation, habitat heterogeneity and tree species composition.

Team members:

The team consists of experienced academic researchers, assisted by younger researchers and PhD and MSc students. The members of the research team are:

Prof. [Miroslav Šálek](mailto:salek@fzp.czu.cz) (contact email: salek@fzp.czu.cz),
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5 most significant recent publications by team members:

Šímová P., Šťastný K. & Šálek M. 2015: Refugial role of urbanized areas and dispersal limitations for declining crested lark (*Galerida cristata*) populations in Central Europe. *Journal of Ornithology* 156: 915-921.

Šálek M. 2012: Spontaneous succession on opencast mining sites: implications for bird biodiversity. *Journal of Applied Ecology* 49: 1417-1425.

Rymešová D., Šmilauer P. & Šálek M. 2012: Sex- and age-biased mortality in wild Grey Partridge (*Perdix perdix*) populations. *Ibis* 154: 815-824.

Hendrychová M., Šálek M., Tajovský K., Řehoř M. 2012: Soil properties and species richness of invertebrates on afforested sites after brown coal mining. *Restoration Ecology* 20: 561-567.

Šálek M., Svobodová J. & Zasadil P. 2010: Edge effect of low-traffic forest roads on bird communities in secondary production forests in Central Europe. *Landscape Ecology* 25: 1113-1124.

Applied outcomes of the research and further potential applications of the research:

- Published detailed and specific recommendations for the research community and for reclamation professionals.
- Applications for proposed effective agri-environmental schemes (northern lapwing on arable land, etc.).
- Baseline data for agriculture and environment subsidy policies (national, EU).
- Methodological tools for post-mining areas and other applications in reclamation practice.
- Advisory material for foresters and forest owners about forest management in relation to biodiversity conservation.



Keywords: *agricultural landscape, avian biodiversity, bird richness patterns, farmland, forest management, habitat management, nature conservation, post-mining landscape, sustainable landscape*