

## SUMMARY

Birds are an important component of farmland biodiversity and, at the same time, one of the most endangered group of vertebrates in Europe. Their conservation includes several strategies based on land-use alterations and less intensive management. All these actions are aimed at increasing the heterogeneity of habitats - one of the most important characteristics of the environment affecting the distribution of animals and increasing species richness. However, concepts describing farmland biodiversity usually ignore the role of singular, often very small, natural or man-made point elements present in agricultural landscapes. Singular point elements in a landscape (SPEL; e.g., singular trees, shrubs, chapels, pylons) may provide basic resources for different species, thus may increase bird diversity but their importance has never been comprehensively reviewed nor empirically tested. Moreover, physical characteristics of the habitat are not the only one describing its suitability, especially since habitat heterogeneity may also indicate unpredictability of habitat suitability in space. Many animals select habitat based on social information, e.g. conspecific presence, known as conspecific attraction. Social information is regarded as a reliable cue and may be more important for species in more heterogeneous landscapes lowering uncertainty in habitat selection process.

In my doctoral dissertation, I define and identify singular point elements in the agricultural landscape (SPEL) commonly occurring in the agricultural space. I also provide a review of the available literature describing each SPEL and evaluate their importance for farmland birds. Using a horizon-scanning technique and internet I asked field ornithologists about their personal observations and impressions about potential roles of such structures for birds. Then, in first comprehensive field study I assessed the associations between the number and types of SPEL and bird diversity and species composition at two spatial scales in agricultural landscapes differing in management intensity. Finally, in a large field experiment I tested whether the social information may modify effects of habitat heterogeneity on the number, clustering pattern and size of territories of a common farmland bird - yellow wagtail *Motacilla flava* L.

I identified 17 SPEL varying in naturalness and age. Analysis of the literature revealed knowledge gaps, because some SPEL are frequently mentioned in ecological studies (e.g. trees, shrubs, pylons), while others such as for example spiritual sites, hunting platforms, road signs, or piles of lime are ignored. Ornithologists often observe birds on various SPEL and link them with many functions important for bird populations. In field study at the landscape scale, species richness was positively associated with the number of SPEL in less intensively managed landscape, but not in more intensively managed one. At the point scale, I found more species with higher abundance next to the trees, pylons, shrubs, and chapels than at the reference points (open fields) in both regions. Ordination analysis at both scales showed significant contribution of SPEL to the species composition. The experiment with the broadcast of yellow wagtails' songs showed that social information had no effect on number and clustering of wagtail territories. However, territory size decreased due to broadcast in less heterogeneous landscapes but increased in more heterogeneous ones. Unexpectedly, the procedural control had similar effect as the social information indicating that experimental manipulation also impacted the results.

In this thesis, I created a theoretical background to study SPEL and provided the first empirical evidence of an association between SPEL numbers and farmland bird populations. I also found experimental evidence that social information may modify the effect of habitat heterogeneity on the territory area of a farmland bird.