Species ecology and the impacts of bioenergy crops: an assessment approach with four example farmland bird species

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The cultivation of energy crops can cause land-use conflicts, including loss of biodiversity in farmlands.

In our study, we focus on farmland birds and analyse whether the impacts of such bioenergy activities differ for bird species with different ecology. We do this by comparing the impacts on four example species; skylark (Alauda arvensis), yellow wagtail (Motacilla flava), corn bunting (Miliaria calandra) and northern lapwing (Vanellus vanellus).

We used a spatially explicit ecological model, which combines three simplified crop selection criteria (suitability for nesting, suitability for foraging, spatial heterogeneity) that differ between the selected species. We used the model to investigate change in breeding pair density between a baseline and several bioenergy scenarios that differ in intensity and spatial agglomeration. We subsequently simulated scenarios with potential positive habitat effects (maintenance of 10% set-aside or 10% alfalfa) as well as spatial effects (increased crop diversity and reduction of field size) as mitigation strategies to increase the breeding pair density.