Metaprogram
BIOSEFAIR

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THESIS

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Can low-intensive agricultural landscapes limit the decline in bird populations?

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Thematics involved
Landscape ecology
Community ecology
Conservation biology

Backgrounds and challenges

A European study has shown that populations of farmland birds have declined by nearly 60% over the last 40 years, and that intensive agriculture is the main pressure associated with this decline (Rigal et al. 2023). It also shows that the impact of intensive agriculture is compounded by the growing impact of climate change on these populations. However, this large-scale study is based on an approximation of agricultural intensity, measured by the value of pesticide and fertilizer purchases per hectare. This approach is not sufficient for analyzing the role of the multiple facets of agricultural intensification on long-term trends in bird populations. The relative weight of each of these components, as well as their spatial and temporal interactions, still need to be elucidated in order to understand the mechanisms behind the observed decline.

Objectives

Through the simultaneous analysis of bird population dynamics and changes in landscape structure and practices over the last 40 years, this thesis project aims to address the gaps in our understanding of the role of different aspects of agricultural intensification on long-term bird population trends.

The project involves the mobilization of data from the Suivi Temporel des Oiseaux Communs (national program) and regional monitoring carried out on three long-term study sites in Occitanie: Coteaux de Gascogne, Pic-Saint-Loup, and Grands Causses.
The aim will be to:

- Assess bird population trends at the national level in relation to different aspects of agricultural intensification (crop rotation diversity, extensive farming practices, and density of agroecological infrastructure);
- Identify the characteristics of these low-intensification agricultural landscapes that favor the maintenance of bird populations in Occitanie in a context of climate change;
- Analyzing temporal variations in the bird response to interactions between different local farming variables (crop rotations, inputs, mowing dates, etc.). The focus on these three study sites in Occitanie, characterized by relatively extensive agricultural landscapes but with spatial variability in the different components of agricultural intensification, should make it possible to identify the contexts that limit biodiversity decline in agricultural environments.

Paysages agricoles d'Occitanie (Pic-Saint-Loup, Coteaux de Gascogne, Causse Méjean)