



“Weeds as crop fellows? Spatio-temporal dynamics of weed communities and their role on biodiversity-mediated ecosystem services along a gradient of human pressures” (FELLOW) – Post-doctoral Researcher

Location: FRB - CESAB, 5, rue de l'École de Médecine, 34000 MONTPELLIER

Duration: 24 months, full time

Salary: from €2,743 to €2,974 gross per month depending on experience

Deadline for receipt of applications: 31 Mai 2025

Provisional start date: Autumn 2025

Job description

- **Context and host structures**

Fondation pour la Recherche sur la Biodiversité (FRB): Created in 2008, the FRB brings together public research institutions, environmental associations, land and biological resource managers and businesses. It provides a focal point for science and society and focuses on the challenges facing biodiversity research today.

CESAB: The Centre for Biodiversity Synthesis and Analysis (CESAB) is a flagship program of the FRB. It aims to carry out innovative work on the synthesis and analysis of existing biodiversity datasets. Advancing knowledge, developing culture and collaboration, and facilitating links between scientific disciplines and stakeholders are the main objectives of CESAB, which welcomes a large number of researchers from all continents each year.

For further information on CESAB: <https://www.fondationbiodiversite.fr/la-fondation/le-cesab/>

Main tasks and activities

FELLOW project

Agroecosystems are one of the terrestrial environments most subject to pressure from human activities, with the intensification of agricultural practices over the 20th century. This is demonstrated by the IUCN red lists, which list many plant species that have disappeared or are in critical danger of extinction, traditionally associated with cereals in France (known as ‘messicoles’), but also the decline of weed species, even common ones, in large-scale farming. Long neglected by the agricultural world, which sees them primarily as ‘weeds’, and by the environmental world, which sees them as part of an artificial habitat created by people, communities of wild plants growing with crops are now recognized as an excellent model for characterizing the impact of the pressures exerted by human activities on terrestrial biodiversity. Weeds can be considered as sentinel species because they are key organisms at the base of food webs in agroecosystems, so their abundance directly influences that of arthropods and birds, which have also declined sharply with the intensification of agriculture. Using multi-scale vegetation surveys in annual and perennial crops in Europe, the FELLOW project aims to quantify the relative importance of different factors on the functional properties of weed flora and to assess its value in terms of biodiversity for providing resources for pollinators, insects, birds and other organisms. The FELLOW project aims to identify the relative impact of anthropogenic pressures and soil and climatic conditions on the functional properties of plant communities present in different crops. We will then focus on the most threatened plant species (messicoles) to identify whether they exhibit a particular combination of traits and to identify more precisely the agroecological conditions likely to ensure their survival. This will highlight the areas to be studied and monitored as a priority and identify where subsidies for suitable agri-environmental measures would be most effective. Finally, we will assess the biodiversity value of spontaneous plant communities in crops and of threatened plants as a support for wildlife diversity. To do this, indicators based on the potential of plants to provide ecosystem services such as pollination and biological regulation using functional traits will be constructed. These indicators will be developed

together with agricultural stakeholders (agricultural advisors, volunteer farmers) to ensure their effective implementation and correct use.

Profile sought

We are looking for an enthusiastic and experienced post-doctoral researcher who is willing to commit to an ambitious collaborative project. The ideal candidate will demonstrate a willingness to learn new methods and be able to contribute proactively to the team.

Skills and qualifications required:

Academic background: PhD in ecology, agricultural sciences, botany, entomology, ideally in the context of agroecosystems.

Specific knowledge:

- Botany, plant-insect relationships (trait-based and phylogenetic approaches, etc.).
- Solid understanding of statistical concepts and analysis of ecological data (GLMM, SEM, multivariate analyses) and the ability to learn new analytical approaches.

Technical skills:

- Programming in R: Advanced experience in programming with R, particularly for processing and visualizing ecological data.
- Reproducibility and scientific workflow: Good knowledge of R Markdown, Quarto and good practice in managing analytical workflows.
- Version management and collaboration: Use of Git and GitHub for version tracking and collaborative work.
- Handling large databases: Ability to handle complex and voluminous datasets (*e.g.* biodiversity, trait management and landscape data across multiple scales, relational databases).
- Good English language (B2 at least)

Soft skills:

- Proven experience of working in a multidisciplinary team.
- Excellent organizational skills and autonomy.

Valuable assets:

- Experience in using structural equation models or ecological interaction network analyses.
- Experience in carrying out meta-analyses.
- Proactivity, flexibility and ability to adapt to a variety of contexts.
- Strong writing skills (reports, scientific publications).

Main tasks:

- Project coordination: Liaise between partners located in France, the UK and Austria, and ensure the completion of key tasks.
- Database management: Set up, standardize and manage a common database integrating environmental, floristic and functional datasets from the European partners.
- Advanced ecological analysis: Derive synthetic variables (taxonomic and functional diversity, biological/ecological traits) and test ecological hypotheses using robust statistical models.

We are looking for someone with a passion for ecology and species interactions, capable of contributing to a collaborative and dynamic environment. This position offers a unique opportunity to work on complex ecological issues related to current challenges in agroecosystems.

Working environment:

The post-doc will be hosted by CESAB (Montpellier) with the possibility of working at CEFE (Montpellier) one or more days a week alongside the project leader. There are also opportunities to visit other members of the consortium. The post holder will be supervised by Elena Kazakou (CEFE, Montpellier) and Guillaume Fried (ANSES, Montpellier) and will benefit from the expertise of all the members of the project (9 people from 3 different countries, specialists in landscape ecology, insect ecology, agronomy and functional ecology). The postdoctoral associate will be able to engage with other postdocs and consortiums working at the Cesab.

The Cesab team will provide methodological support (support for the team of data-scientists, a dedicated budget to meet regularly with the project leaders or collaborate with certain consortium members, provision of training relevant to the project) and logistical support (laptop, organization of missions, support with administrative formalities, etc.).

How to apply:

Applicants should send:

- A covering letter specifying your interest in the post and how your skills match the profile (no more than 500 words)
- Your curriculum vitae (including contact details of 2 referees).

Applications must be sent no later than: 31 Mai 2025 at Guillaume Fried (guillaume.fried@anses.fr) and Elena Kazakou (elena.kazakou@cefe.cnrs.fr)