FRB-Cesab postdoctoral position – research project ACOUCENE

Inferring connectivity patterns of ecological soundscapes from a reconstruction approach based on bird communities and citizen science data.

Location: FRB – CESAB, 5, rue de l'École de Médecine, 34000 MONTPELLIER
Contract: 2 years fixed term, full time
Salary: 2568 € gross per month, tickets-restaurant, partial coverage of transport costs and health insurance

Closing date for application: 28/02/2023

Starting date: mid-June 2023

About FRB and CESAB

The **Foundation for research on biodiversity (FRB)** was created in 2008. It gathers public research institutions, environmental NGOs, land and genetic resources managers and the private sector. It provides a forum where science meets society in order to address the current challenges related to biodiversity research.

The Centre for Synthesis and Analysis of Biodiversity (CESAB) is FRB's main programme and a leading research organization in Europe, with an international reputation. Launched in 2008 after the "Grenelle de l'Environnement" by the Ministries for research and for ecology, it was created by eight public research institutions (BRGM, CIRAD, CNRS, IFREMER, INRA, IRD, IRSTEA and MNHN), joined in 2014 by LVMH and in 2017 by the University of Montpellier.
Its aim is to implement the innovative work of synthesis and analysis of existing data in the field of biodiversity. Advancing knowledge, developing culture and collaboration, facilitating links between scientific disciplines and with the stakeholders, are the main objectives of CESAB, which welcomes every year a large number of researchers from all continents.

For more information about CESAB: *https://www.fondationbiodiversite.fr/la-fondation/le-cesab/*

The project

Regional-level strategies for biodiversity conservation necessitate ecological networks of connected habitats in which species can circulate free of anthropogenic barrier all along their lifecycle. The idea of a similar network for soundscapes, the acoustic component of landscapes, has recently emerged to protect

animal species interacting through sounds. This network, coined the "white thread", would contribute to warrant the integrity of soundscapes, as required by a French parliament law voted on January 29, 2021. A reference map of continental France's white thread is thus necessary but faces the lack of direct recordings of soundscapes with sufficient spatial and temporal coverage. ACOUCENE will tackle this aim through model-based soundscapes reconstruction, focusing on a flagship indicator of biodiversity declines, bird sounds. ACOUCENE will proceed in four stages:

- the construction of soundscapes from bird sounds recordings gathered from citizen-science databases, paired with bird community composition data from atlases and breeding bird surveys;
- a network-based model of the white thread and of its predicted variations due to bird community changes in the 30 last years;
- predictions on its future in the face of climate and land use changes;
- the identification of high-patrimonial value areas based on the characteristics of the white thread.

The project is based on a data synthesis and analysis approach using a combination of protocoled bird data (French Breeding Bird Survey; French Bird Atlas), non-protocoled sound recordings (Xeno-Canto database) and environmental predictors. The methodological workflow will rely on a combination of data exploration and synthesis, statistical modeling and network analysis.

An international consortium composed of bio/ecoacousticians, landscape ecologists, geographers and stakeholders from the LPO (Ligue pour la Protection des Oiseaux) will work with the postdoc to construct and implement the workflow, gather and explore data, and broadcast results. The consortium will have very regular contacts with the two PIs and will meet twice a year at the CESAB during the duration of the project (2023-2025). The postdoc will also have opportunities to exchange and visit consortium members throughout the course of the project.

Your role

As a postdoc, you will be the core of the ACOUCENE consortium. We wish to provide you an exciting research experience as well as an opportunity to increase your international teamworking skills. You will:

- Implement the main project: gather, store and clean data, perform the analyses, interpret the results and broadcast through international publications and presentations to congresses
- Work together with the consortium members and CESAB's experts in a collaborative and exploratory spirit
- Prepare and lead the consortium's meetings together with the PIs and the CESAB
- Broadcast the project through your preferred medias and communication modes

Although you will be based in the CESAB, Montpellier, on a day-to-day basis, you will have the opportunity to visit regularly the PI's labs and do exchange periods in the consortium members' lab. We expect from our postdoc a commitment to perform high-quality research focused on the project, unquestionable scientific ethics, enthusiasm for collaborative work and regular communication with the PI's and consortium members on the project's flow. In turn, the PI's and CESAB will provide the postdoc with stimulating and comfortable working conditions, a friendly and motivating environment, and support for her/his future professional ambitions after the completion of the postdoc.

The PIs

Jean-Yves Barnagaud is a spatial ecologist with research interests at the interface between landscape ecology, biogeography and functional ecology. Most of his current work relates to the distribution of species and ecological traits along gradients of habitat composition and structure, mostly on birds. He uses a variety of statistical approaches based on multiple types of data, including atlases, large-scale standardized

samplings, and opportunistic records from naturalists. He is currently an associate professor at the Ecole Pratique des Hautes Etudes at the Centre d'Ecologie Fonctionnelle et Evolutive, Montpellier.

Solène Croci's is an urban landscape ecologist. Her research focuses on the effects of anthropogenic land use changes on species' distribution (vertebrates and arthropods) and landscape connectivity. Her recent work aim to assessed the functionality of ecological corridors in urban landscapes by using connectivity networks mapped with resistance-based models and individuals' movements based on field tracking. She is a researcher at the Centre National de la Recherche Scientifique and a member of the laboratory Littoral-Environnement-Télédétection-Géomatique in Rennes.

Qualifications

This project is grounded on large data sets and statistical analysis. We are therefore looking for candidates who are enthusiastic about working on data, analysis softwares and models. Collaborative working implies facilities to work with a group of researchers from various scientific origins, ability to communicate in English and to organize fruitful and exciting research meetings. A variety of profiles are possible: we care most about commitment to the project, rigor in execution, a good balance between autonomy and teamworking, and most importantly enthusiasm.

The ideal candidate will have a PhD in bioacoustics, ecoacoustics or other fields of ecology with demonstrated skills in bioacoustics. Solid knowledge and demonstrated experience in statistical modelling, data management and processing in R and/or Python are key to the project. Alternatively, we would also consider applications from specialists in ecological modeling with demonstrated skills in in data processing, spatial modeling and network analysis, with a strong willingness to learn about biostatistics. Ability to written and oral communication in English are necessary. Ornithological knowledge will be appreciated although it is not a requirement.

The candidate will be hosted at the FRB's Cesab, 5 rue de l'école de médecine 34000 Montpellier. He will benefit from the centre's scientific dynamics, its working groups and its team of post-doctoral fellow.

Application instructions:

Applications must be sent **no later than 28/02/2023** to solene.croci@univ-rennes2.fr and jean-yves.barnagaud@ephe.psl.eu

- A cover letter;
- Your curriculum vitae ;
- One or two publications as a first author, if you have any;
- The names of three academic referees, among which at least one should not have been your Msc or Phd supervisor.