Mobilizing tracking data to support the conservation of birds migrating between Africa and Eurasia

Context

Migratory birds undertake spectacular movements across continents and oceans, coupling distant ecosystems and linking multiple political jurisdictions. The African-Eurasian flyway is one of the largest avian migratory systems in the globe: from Portugal to Russia, billions of migratory birds cross the skies of this flyway twice a year, leaving their breeding areas across Europe and Central Asia in search of suitable areas, often in sub-Saharan Africa to spend the non-breeding season. Throughout their annual cycles, these migratory birds face a suite of threats, and as a result, many populations of African-Eurasian migrants are declining. Minimizing these threats to ensure the long-term conservation of migratory bird populations requires the involvement of multiple countries that, being linked by the movements of these birds, share the responsibility to conserve them. Yet conservation planning for migratory birds is particularly challenging because they move across vast regions during their life cycles, with different species, and individuals within the same species potentially being exposed to different threats in very different areas.

In recent years, advances in tracking technologies allowed unprecedented insights into the annual cycles, connectivity patterns and migratory strategies of many Afro-Palearctic migratory birds. This information has been typically dispersed across disparate, usually single species scientific studies, but combining tracking data from multiple populations and species can allows us to contrast individuals, species and populations in terms of their exposure to different threats and thus to test hypotheses about the drivers of declines. Furthermore, recent mechanistic models of bird migration have shed light on the ecological processes driving bird migration at macroecological scales, and they can be used to make predictions of how migratory bird communities will respond to large-scale changes in climate and resource availability. These models are thus a new tool that can be applied to exploring scenarios of change at the scale of the African-Eurasian flyway.

Project aims

The overarching aim of this PhD project is to improve understanding on the threats affecting long-distance migratory landbirds in order to inform conservation policy at the scale of the African-Eurasian flyway. More specifically, the project will answer the following questions:

- What is driving the population declines of Afro-Eurasian migratory landbirds?

- How are migration patterns along the Afro-Eurasian flyway predicted to change in response to ongoing threats?

- What are the priority actions for the conservation of African-Eurasian migratory landbirds at the flyway scale?

These questions will be answering by combining tracking data from multiple bird species with data on the spatial and temporal distribution of threats across Europe and Africa, and data on species traits and conservation status.

Supervision, institutional context and work conditions

This project is co-supervised by Ana Rodrigues (CEFE, Montpellier), and Inês Catry (CIBIO, Lisbon), and funded by the "Biopolis" Teaming Horizon2020 programme. The student will be recruited under a three year Doctoral Contract with the University of Montpellier, and enrolled at the GAIA Doctoral School.

This is a desk-based project focused on the analysis of large datasets. The student will be physically based at the Center for Evolutionary and Functional Ecology (CEFE) in Montpellier, where s/he will integrate the MAD team (Movement, Abundance, Distribution) of the Department on the Dynamics and Conservation of Biodiversity.

The student will spend one month per year at the CIBIO, including one period during the spring aligned with fieldwork (ongoing projects on the migration of White Storks, European Rollers, and Common Kestrels) and another in the autumn for discussions and joint work. In addition, the student will have the opportunity to meet collaborators at BirdLife International, BTO, RSPB and other institutions in Cambridge, UK, as well as to participate in two international scientific meetings. Accommodation and travel for these missions outside Montpellier will be covered by the project.

Student profile

Required:

- A Master's degree in ecology or a related field
- A strong academic record
- Competency in the use of R including in the manipulation of datasets and statistical analyses
- Good proficiency in English (oral and written)
- Good conversational skills in French
- Enthusiasm for science and for conservation
- Good collaborative skills

Desirable:

- Experience in spatial data analyses (e.g., with R, QGIS, ArcGIS)
- Field ornithology experience or other naturalist skills

Application process

Send the following documents[1] to ana.rodrigues@cefe.cnrs.fr, by the **28 August**:

- **CV** (in English), including the contacts of two referees[2].
- **Cover letter** (in English), explaining how you fit the above-listed requirements, and why you would like to do this PhD project.
- **Transcripts** (list of courses and grades) of your undergraduate and of your Master degrees[3].

We will get back to applicants by the 6th of September to let them know if they have been invited for an interview. Interviews of shortlisted candidates will take place from the 13-15 September. Beginning of contract: 1 November 2023 (or as soon as possible given necessary paperwork).

References

Briedis, M., *et al.* (2020). Broad-scale patterns of the Afro-Palaearctic landbird migration. *Global Ecology and Biogeography*, *29*, 722–735. https://doi.org/10.1111/geb.13063

Buchan, C., Franco, A. M. A., Catry, I., Gamero, A., Klvaňová, A., & Gilroy, J. J. (2022). Spatially explicit risk mapping reveals direct anthropogenic impacts on migratory birds. *Global Ecology and Biogeography*, *31*, 1707–1725. https://doi.org/10.1111/geb.13551

Guilherme, J. L., Jones, V. R., Catry, I., Beal, M., Dias, M. P., Oppel, S., Vickery, J. A., Hewson, C. M., Butchart, S. H. M., & Rodrigues, A. S. L. (2023). Connectivity between countries established by landbirds and raptors migrating along the African–Eurasian flyway. *Conservation Biology*, *37*, e14002. https://doi.org/10.1111/cobi.14002

Somveille, M., *et al.* (2021). A general theory of avian migratory connectivity. *Ecology Letters*, *24*, 1848–1858. https://doi.org/10.1111/ele.13817

Vickery, J. A., *et al.* (2023) The conservation of Afro-Palaearctic migrants: What we are learning and what we need to know? *Ibis, 165,* 717-738. https://doi.org/10.1111/ibi.13171

Zurell, D., *et al.* (2018). Long-distance migratory birds threatened by multiple independent risks from global change. *Nature Climate Change*, *8*, 992. https://doi.org/10.1038/s41558-018-0312-9

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[1] For sending large files (>3 MB) please use a file sharing system (e.g. WeTransfer) rather than attaching them to email. Emails with large attachments are automatically filtered out by our email server and will not reach us. We will send an acknowledgement email to confirm reception of all applications.

[2] People who have worked with you previously (e.g. supervisors of Masters projects) and who would be willing to comment on your suitability to this position. They will only be contacted (in early September) if you are shortlisted for an interview.

[3] No need for a translation if these documents are in English, French, Portuguese or Spanish; otherwise please add your translation.