

## **Modelling functional connectivity of butterflies across landscapes using population and genetic data**

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**Co-supervisors:** John Day, NERC Centre for Ecology and Hydrology; Kevin Watts, Forest Research; Mike Bruford, University of Cardiff

We seek an enthusiastic and highly-motivated candidate to work on a project at the frontier of conservation science. The project will address gaps in conservation policy by developing new methods to assess functional connectivity- the ability of species to move across different landscape types. Understanding functional connectivity is critical for species conservation under a changing climate and for the delivery of many ecosystem services (e.g. pollination).

The successful PhD student will work on butterflies and pilot the development of a novel spatially replicated, long term genetic monitoring scheme with matching long term population data to match (from UK Butterfly Monitoring Scheme volunteer transects). This will involve a campaign of sampling and liaising with volunteers to obtain additional samples from across the UK. Population genetic data and synchrony in long-term population counts will then be used to develop indicators of functional connectivity for use in applied conservation and ecosystem service assessments.

The studentship will be based with Dr. Tom Oliver at the University of Reading, and working closely with the Centre for Ecology and Hydrology (Dr. John Day) and Forest Research (Dr. Kevin Watts; with FR providing CASE support).



### **Training opportunities:**

This studentship offers an excellent and diverse training opportunity. During the piloting of the population monitoring scheme, the student will gain experience in field collection techniques and protocols in long term sample archiving and data management, followed by training in population genetics (lab and analytical) and advanced statistical analysis techniques for population ecology (e.g. using the programs R, ArcGIS). In addition, in liaising with partners Butterfly Conservation and other European butterfly monitoring schemes, the student will gain skills in workshop planning and develop a strong network of NGO contacts. There is also opportunity for a research placement at Forest Research. The student will form part of a thriving research team and join group meetings with existing staff and PhDs working in related areas (e.g. species range shift under climate change, landscape

genetics of wood crickets and mice). Through these group meetings the student will gain valuable skills in critical thinking (e.g. through journal clubs) and presentations (through practice with peers and at conferences). This training should lead to a broad and well balanced skill set that is attractive to employers.

**Student profile:**

We are looking for an enthusiastic and highly-motivated candidate keen to work on this project extending the state-of-the-art in conservation science. The individual must be high-achieving with evidence of-, or promise for-, developing a broad set of advanced skills. Essential skills on applying are a minimum 2:1 BSc (or equivalent in Life Sciences), good numerate skills and a strong enthusiasm for conservation science. Desirable skills are statistical analysis using R software, experience in communicating science to a broad audience and population genetics experience.

**Funding particulars:**

The project has CASE support from Forest Research.

**References: (optional)**

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Storfer, A., Murphy, M.A., Evans, J.S., Goldberg, C.S., Robinson, S., Dezzani, R., Delmelle, E., Vierling, L. & Waits, L.P. (2007). Putting the 'landscape' in landscape genetics. *Heredity*, 98, 128-142

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