

## INTERNSHIP 3: RESTORING FOR ECOLOGICAL RECOVERY AND RESILIENCE: A GLOBAL MODELLING APPROACH

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**Internship Location:** UKCEH Edinburgh, Bush Estate, Penicuik, Midlothian, EH26 0QB

### **Project Description:**

Ecosystem restoration is widely recognised as a critical solution to addressing the global biodiversity loss and climate crises. However, to ensure their sustainability, restoration actions must be designed to achieve effective recovery and long-term resilience of the restored ecosystems. This requires predictive models capable of capturing the dynamics of complex ecological systems, accounting for the interactions among species and their relationship with the landscape. However, the lack of a general, globally applicable modelling framework currently limits the effectiveness of our restoration efforts.

This project will contribute to advancing our understanding of the ecological consequences of landscape restoration. The internship will focus on landscape configuration – examining global trends and its influence on recovery and resilience of ecological communities. This will involve the analysis of empirical landscape data from around the world, as well as computational modelling. The intern will conduct research under the supervision of scientists from UKCEH and in collaboration with researchers from the University of Zurich and ETH Zurich in Switzerland.

This internship provides a unique opportunity to:

- Learn about ecological modelling and network analysis approaches, and their application to ecological conservation and restoration.
- Engage with a multidisciplinary research team, including leading experts in ecology and restoration science.
- Use programming languages such as R and Julia for modelling and data analysis.
- Develop key skills in data synthesis and analysis, coding, scientific writing, and collaborative teamwork.
- Contribute to strategies for effective and resilient ecosystem restoration, supporting global efforts to combat biodiversity loss and climate change.

### **Tasks:**

- Reviewing and synthesising published research on landscape configuration globally
- Parameterising community dynamics models using data obtained from published literature
- Performing computational simulations and analysing outcomes
- Collaborating with project partners
- Reporting and presenting findings

### **Expected Outcomes:**

- A written report summarizing project's findings, with the potential for submission as a journal publication.
- Development of intern's quantitative and communication skills.
- Deeper understanding of ecological restoration, specifically the relationship between landscape configuration and ecosystem resilience at the global scale.
- Generation of practical recommendations on the design and management of restoration projects.

**Required Skills and Background:**

## Essential:

- Currently in undergraduate or postgraduate (including PhD) education at university or have graduated within the six months prior to the start of the internship (30th June 2025)
- Background in ecology, zoology, environmental or physical science
- At least an intermediate level of coding proficiency in programming languages such as R or julia
- Interest in conservation or restoration
- Ability and enthusiasm to learn and apply quantitative skills

## Desirable:

- Knowledge of network analysis
- Experience in population dynamics models
- Interest in a career in scientific research or conservation practice