PhD Project Advertisement

Project title: Optimizing UK landscapes for agroecosystem resilience
Project No: FBS2022-35-Johnston-cr

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Project description:

Biodiversity loss is an existential threat to global food security, and agriculture plays a pivotal role in the protection of species for agroecosystem resilience. Functionally important bioindicators, such as earthworms, collembola, and hoverflies, play important roles in multiple agroecosystem functions (e.g. soil structure, carbon cycling and pollination), but their populations can decline drastically in response to agricultural practices. Landscape composition (e.g. habitat quality and connectivity) can alleviate or exacerbate the effects of management practices, but population responses depend on interactions between species traits, environmental factors, and their exposure to multiple stressors.

Predictive tools are needed to better understand and predict the effects of multiple agroecosystem scenarios on key bioindicators, to support sustainable agricultural management decisions. This project will develop a mechanistic landscape-scale model for several bioindicators to predict the consequences of multiple environmental changes on agroecosystem resilience.

A mechanistic modelling approach will be adopted, in which species population dynamics emerge from individual physiological and behavioural responses to shifting landscape, environmental, and management scenarios in spatially explicit landscapes. Models will be extensively validated with UK biodiversity datasets and applied to investigate optimal agricultural landscapes for key bioindicators and ecosystem resilience. Model outcomes have important implications for environmental and agricultural policy at the national and international scale.

Training opportunities:

Specialist training will be offered in individual-based modelling in RNetLogo and fieldwork.

Student profile:

This studentship is available only to individuals who are eligible for UK fees status. We encourage applications from all relevant disciplines, with a minimum 2:1 BSc honours degree or equivalent post-graduate work experience.

Stipend (Salary):

FoodBioSystems DTP students receive an annual tax free stipend (salary) that is paid in instalments throughout the year. For 2022/23 this will be £17,668 and this will increase slightly each year at rate set by UKRI. For up to date information on funding eligibility, studentship rates and part time registration, please visit the [FoodBioSystems website](#).

Equality Diversity and Inclusion:

The FoodBioSystems DTP is committed to equality, diversity and inclusion (EDI), to building a doctoral researcher(DR) and staff body that reflects the diversity of society, and to encourage applications from under-represented and disadvantaged groups. Our actions to promote diversity and inclusion are detailed on the [FoodBioSystems DTP website](#).

In accordance with UKRI guidelines, our studentships are offered on a part time basis in addition to full time registration. The minimum registration is 50% FT and the studentship end date will be extended to reflect the part-time registration.

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