



## Research Fellow in spatial ecological analysis and modelling

46 month postdoctoral position (or may be split into 2 shorter posts if desired)

We are looking to recruit a dynamic Early Career Researcher with a proven track record in ecological theory, spatial mathematical or statistical modelling and/or software development to address a number of exciting projects funded by 3 EU projects (EU-BON, SCALES and ExpeER):

**Developing spatial niche models** (EU-BON, SCALES). Niche models are widely used to predict species distributions and to forecast responses to future environmental change. However, classical bioclimatic niche models have been criticised for ignoring the spatial structure of populations, greatly reducing their predictive power. Conversely, spatial downscaling approaches rely exclusively on spatial patterning to infer fine scale occupancy, but are insensitive to environmental predictors of where such populations should be found. The goal here is to develop a hybrid approach, one that takes advantage of both spatial and environmental pattern information. These approaches will be tested and applied to high-quality biodiversity datasets.

**Developing up-scaling and down-scaling analytical tools** (EU-BON, SCALES, ExpeER). Biodiversity, abundance and function are spatially complex, multi-scaled and often non-additive. Various techniques have been developed for inferring coarse scale biodiversity from sets of local samples (biodiversity up-scaling) and conversely to infer fine scale occupancy from coarser scale distributional data (population down-scaling). We hope to further develop these tools, e.g. to allow up-scaling in the absence of count data, using information on spatial turnover patterns. We also need to develop software tools or analytic libraries and appropriate documentation, to make these approaches more widely available to non-specialist researchers and conservation analysts. We will also test for efficient sampling designs to be used in applications of these approaches to population and biodiversity monitoring.

**Implementing improved remote sensing vegetation models** (EU-BON). Remotely sensed images are typically classified on the basis of spectral reflectance data. The spatial scales of ancillary variables typically receive little attention in the classifications of vegetation from remotely sensed images; however recent research in our group has shown that incorporating widely available environmental datasets (e.g. DEM, soils) at local and neighbourhood scales has the potential to inform and greatly improve such classifications, allowing much finer vegetation differentiation and higher accuracy than would otherwise be possible. We will further develop these methods to incorporate information about temporal variation in reflectance and in vegetation, and develop application software to make them more widely available.

These three goals are linked; the vegetation modelling involves a form of the spatial niche modelling, and the resulting vegetation maps could serve as habitat variables for modelling animal distributions. Moreover, both involve explicit scaling approaches, tied to the downscaling methods.

The Research Fellow will join a large and varied team of academics, postdoctoral researchers and postgraduate students from both the Kunin and Benton labs, and the wider Leeds ecology and evolution research group. They will also have the opportunity to form collaborations with a wide circle of researchers across Europe and beyond, and to participate in the three project teams.

**Application deadline:** 14 March 2013. For information contact Bill Kunin: [w.e.kunin@leeds.ac.uk](mailto:w.e.kunin@leeds.ac.uk)  
**For further details and application materials:** <http://jobs.leeds.ac.uk>, Reference: **FBSBY0002**