The Global Ecology Lab and the Environment Institute at the University of Adelaide have four PhD projects currently available in ecological modelling and environmental change.

Please address all enquiries for eligibility requirements and additional information to:

Prof. Barry W. Brook
School of Earth and Environmental Sciences
The University of Adelaide, Australia 5005
Phone : +61 8 8313 3745
Email : barry.brook@adelaide.edu.au

PhD Project: **Genotypic relationships of Australian rabbit populations and consequences for disease dynamics.**

Historical evidence suggests that there were multiple introduction events of European rabbits into Australia. In non-animal model weed systems it is clear that biocontrol efficacy is strongly influenced by the degree of genetic diversity and number of breed variants in the population.

The PhD candidate will build phylogenetic relationships for Australian rabbit populations and develop landscape genetic models for exploring the influence of myxomatosis and rabbit haemorrhagic disease virus (RHDV) on rabbit vital rates (survival, reproduction and dispersal) at regional and local scales. Multi-model synthesis will be used to quantify the relative roles of environment (including climate) and genotype on disease prevalence and virulence in rabbit populations.

The project will be co-supervised by: A/Prof Phill Cassey, Dr Damien Fordham and Prof Barry Brook

PhD Project: **Spatio-temporal drivers of rabbit life-history traits and its influence on the efficacy of rabbit control in Australia**

Identifying general patterns of how, and in which situations, demographic rates vary across space and time, is necessary to understand the true population dynamics of a species.

The PhD candidate will do a focused meta-analysis of rabbit demographic studies, combined with separate spatial information on climate, land use and disease. The meta-analysis will be supported by a survey of Australian rabbit disease and biology experts, to elicit expert (prior) knowledge of key drivers of rabbit demographic rates and disease dynamics. Bayesian and Information-Theoretic statistical approaches, informed by expert opinion and controlling for disease, will be used to determine the main environmental predictors of rabbit demographic rates. Data on sensitivity to different demographic traits (e.g., age-specific survival and reproductive rates) and particular environmental conditions (e.g., drought) will be integrated into individual-based, spatially oriented demographic models.

The project will be co-supervised by: Dr Damien Fordham, Prof Barry Brook and A/Prof Phill Cassey

PhD Project: **Range dynamics and demographics of spatially structured reptile populations under global change**

Distributional range margins, for the majority of species, end at seemingly arbitrary boundaries. We will develop a demographic framework to characterise the edge-of-the-range dynamics of a variety of reptiles by examining combinations of intrinsic and extrinsic factors thought to limit geographic extent.

The PhD candidate will exploit advanced statistical and computational approaches to integrate multiple lines of information on the drivers of range and abundance in turtles, skinks and geckos using detailed long-term data sets. The results will provide generalisations on how geographic range size and structure change through time in response to global change and deliver a new toolbox for exploring trade-offs inherent in conservation planning.

The project will be co-supervised by: Dr Damien Fordham, Prof Barry Brook and Prof Corey Bradshaw

PhD Project: **Determining the influence of global change on turtle biodiversity in Australia**

Global warming is forecast to influence turtle fauna through local and regional climate change and synergies with other human-induced drivers of environmental change.

The PhD candidate will use comprehensive occurrence and molecular databases and spatial information on climate and environmental variation to identify how turtle biodiversity changes spatially, and the important drivers of that change. Community composition models will be used to project changes in turtle diversity under future scenarios of climate and land-use change. In particular the student will explore the relationship between increasing demand for water and climate change, and its potential influence on turtle fauna. Results and associated models will provide important insights into future turtle conservation management in Australia and beyond.

The project will be co-supervised by: Dr Damien Fordham, Prof Barry Brook and Prof Arthur Georges

The Invasive Animal CRC and the Global Ecology Lab at the University of Adelaide have three PhD projects currently available in invasive species ecology and wildlife epidemiology.

Please address all enquiries (for the projects listed below) for eligibility requirements and additional information to:

Dr Phill Cassey
School of Earth and Environmental Sciences
The University of Adelaide, Australia 5005
Phone : +61 8 8303 4042
Email :phill.cassey@adelaide.edu.au

Exotic vertebrate risk analysis and invasion pathway modelling

Supervisors: Dr Phillip Cassey (UoA), NRM Biosecurity SA

The successful candidate will collect up-to-date datasets on the identities and abundances of exotic vertebrate ornamental fish species in retail, private, and public Australian collections, as well as at large in the environment. The student should have strong statistical and/or mathematical skills and be capable of developing novel computational tools for calculating species incursion risks and constructing invasion pathway networks. The model outputs will be used to predict the specific supply regions, transport modes, user groups, and taxa that pose the greatest risk to the entry and establishment of new pest populations in Australia.

The role of rabbit and virus genetics in the development of resistance to rabbit haemorrhagic disease virus (RHDV)

Supervisors: Dr Nina Schwensow (UoA), Dr Dave Peacock (Biosecurity SA), Dr Phillip Cassey (UoA)

The European rabbit is a major pest animal in Australia. The successful PhD candidate will conduct both field and laboratory research to further understand resistance to RHDV including age related factors, possible interactions with myxomatosis, and virus and rabbit genetics. The candidate will have access to epidemiological, serological, tissue, genetic, morphological and population dynamics data from an ongoing 16 year research project centred on an isolated rabbit population located 70 kilometres north of the City of Adelaide, South Australia.

Rabbit Haemorrhagic Disease Virus: Mechanisms of transmission

Supervisors: Dr Phillip Cassey (UoA), Dr Tarnya Cox (NSW Primary Industries)

The aim of this project is to develop a greater understanding of the interactions between rabbits, RHDV and the environment. Topics such as virus persistence, outbreak dynamics, and modes of transmission will be investigated. The student should have broad ecological skills with an epidemiology background. The PhD will be based at both the University of Adelaide and the Vertebrate Pest Research Unit in Orange NSW