

Invasion Biogeography & Quantitative Ecology

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Human actions have contributed to pervasive changes in biodiversity at a variety of scales through the dual processes of species extinction and introduction. We are interested in the use of invasive vertebrate populations as models for studying the flexibility in behavioural and physiological traits during the invasion process. All projects will be well-supported logistically and the development of individual research projects, to match the students' interests, will be particularly encouraged.

Interested candidates should refer to our website for further information:

<http://www.cassey-invasion-ecology.org/>

Our research has strong research and collaborative funding ties with Biosecurity SA (<http://www.pir.sa.gov.au/biosecuritysa>) and the quantitative sciences and invasive species groups in the Australian Bureau of Agricultural and Resource Economics and Sciences (<http://www.daff.gov.au/abares>). We are participating members of the Invasive Animals CRC (<http://www.invasiveanimals.com/>). Scholarships are available for candidates with particularly strong academic records.

A number of projects are available in Animal Behaviour and Physiology, Biosecurity Risk and Policy, Invasive Species Biology, Global Change Ecology, and Biogeography. Examples of some of these are listed below:

Distribution and habitat preferences of overabundant vertebrate pests

South Australia has a number of over-abundant (exotic and native) vertebrate pest species. These species include over-abundant native marsupials (Kangaroo Island) and exotic mammals (Mount Lofty Ranges). These projects will work with state and local Government agencies and stakeholder groups to determine the distribution and habitat preferences of over-abundant species and the impacts that these populations are having on other species and native communities. Guidelines for their future management will be developed. The suitable candidate should be prepared to undertake a project with both intensive field and quantitative components, and (on Kangaroo Island) live away from Adelaide for extended periods.

Monitoring of threatened species in the Mount Lofty Ranges

Effective conservation of threatened species relies on an adequate and reliable knowledge of their distribution. Threatened species are usually sparsely distributed and their populations are localised, resulting in challenging situations to conduct essential monitoring programs. These projects will examine different methods and techniques for obtaining reliable information about the status of: (i) a vulnerable bird species (*Zoothera lunulata halmaturina*); and (ii) threatened reptile species in the Mount Lofty Ranges. The results would be of interest not only for the management of the particular study species, but also to a broader audience of both researchers and managers. The suitable candidate should be prepared to undertake a project with both intensive field and quantitative components.

Overgrazing in the Mount Lofty Ranges

Overgrazing of remnant woodlands by native and exotic herbivores is a critical conservation issue. However, the spatial distribution of grazing pressure, and flow-on effects for biodiversity, are poorly understood. This project will map current grazing pressure throughout the Mount Lofty Ranges using rapid vegetation assessments and, using comprehensive data available from the woodland

bird monitoring programme, quantify relationships between grazing pressure and bird diversity. This project will inform herbivore-management approaches and links strongly with currently funded research seeking woodland management strategies that optimise conservation outcomes. The student will be expected to work closely with a number of internal and external stakeholders, including the Department of Environment and Water Resources and the Nature Conservation Society of South Australia. The suitable candidate should be prepared to undertake a project with both intensive field and quantitative components.

Native predators as novel promoters of exotic pest control

Mice plagues are an increasing agricultural issue with the change of tilling practices in the South Australian range lands. This project (based on the Yorke Peninsula) will examine the distribution and resource limitation of native barn owls, *Tyto alba* (habitat, roosting, and nesting), and the potential placement and occupancy of artificial nest boxes across agricultural and conservation areas. The suitable candidate should be prepared to undertake a project with both intensive field and quantitative components, and live away from Adelaide for extended periods.