



THE UNIVERSITY
of ADELAIDE

PHD SCHOLARSHIPS: ENVIRONMENTAL GENOMICS & BIODIVERSITY CONSERVATION

We are currently looking for two enthusiastic PhD students to work on a new project **preventing extinctions of Australia's threatened mammals with DNA**.

These PhD projects will be part of a recent Linkage Project funded by the Australian Research Council, involving several senior and postdoctoral scientists, and conservation practitioners. The successful candidates will work closely with this diverse and highly skilled group of researchers.

Background: Australia's unique mammals have suffered the highest rate of recent extinctions of any continent. Reversing further declines, and averting new extinctions, requires more detailed understanding of past distributions and preferred habitats. These PhD projects will use ancient DNA extracted from sediment and bulk-bone deposits to reconstruct spatial patterns of mammals and plants across Australian landscapes. Their significance is that they will establish historical distributions and habitats of Australian threatened mammals at geographic scales and spatial resolutions needed for evidence-based ecological restoration.

Position 1: Establishing past mammals and their habitats using sedimentary DNA

Ancient DNA from sedimentary archives is now providing information on the former distribution and diversity of life that was previously invisible in the fossil record. This PhD project will leverage methodological breakthroughs in sedimentary ancient DNA to provide a direct window into how pre-European patterns of mammal and plant diversity once varied across Australian landscapes. Specifically, the successful PhD candidate will use high throughput analysis of sediment and high performance computing to generate inventories of pre- and post-European assemblages of Australian native mammals and their vegetation communities at a geographic scale never done before. This will deliver the very information conservation organisations need to optimise future efforts to restore and safeguard Australia's most threatened mammals.

Supervision and mentoring: will be provided by A/Prof. Damien Fordham, Dr Jamie Wood and A/Prof. Jeremy Austin at the University of Adelaide's Environment Institute and Australian Centre for Ancient DNA. These supervisors and their labs are international leaders in the fields of environmental genomics, ancient DNA and biodiversity conservation. They will collaborate with staff from Australia's three largest non-profit conservation organisations: Bush Heritage, World Wildlife Fund-Australia, and the Australian Wildlife Conservancy.

Position 2: Quantifying losses of mammals at key conservation areas using bulk bone metabarcoding

Bulk bone metabarcoding is enabling effective species identification of fragmentary bones from archaeological and paleontological excavations. This project will establish past mammal assemblages by applying these new ancient DNA techniques to highly fragmented and morphologically indistinct late-Holocene aged fossil bones collected from caves across Australia. Specifically, the successful PhD candidate will use bulk bone metabarcoding and high performance computing to generate inventories of pre-European assemblages of Australian native mammals in priority conservation areas, spanning broad climates and environments. New

scientific understandings will allow current-day patterns of mammal diversity to be contextualised, recovery targets for threatened species strengthened, reintroduction programs optimised.

Supervision and mentoring: will be provided by A/Prof. Damien Fordham, Dr Jamie Wood and Dr Liz Reed at the University of Adelaide's Environment Institute and Australian Centre for Ancient DNA. These supervisors and their labs are international leaders in the fields of environmental genomics, ancient DNA, biodiversity conservation and paleoecology. They will collaborate closely with staff from the Australian Museum and NSW National Parks and Wildlife Service, as well key conservation organisations.

You should have:

- First Class Honours or Master degree in genomics, population or conservation genetics or bioinformatics
- A strong interest in biodiversity conservation, paleoecology and or community ecology
- DNA laboratory experience and competency in statistical analysis
- Excellent time and data management and interpersonal skills
- Evidence of well-developed verbal and written communication skills

Desirable Characteristics

- Publication record in peer-reviewed journals
- Experience with ancient and /or environmental DNA
- Familiarity with metabarcoding data and its analysis.
- Knowledge of advanced statistical languages such as R, Python or Matlab
- Familiarity with field based data collection

Salary: Tax free stipend of \$34,210/yr (AUD) for 3.5 years

Applying:

Your application should:

- include your résumé/Curriculum Vitae and copies of any published papers
- address the selection criteria
- include residency status
- include the names, addresses and/or email details of two referees

Email applications to damien.fordham@adelaide.edu.au.

If you have any queries regarding this position, please contact A/Prof. Damien Fordham (damien.fordham@adelaide.edu.au); or Dr Jamie Wood (jamie.wood@adelaide.edu.au)