

WESTERN SYDNEY
UNIVERSITY



Hawkesbury Institute
for the Environment

RESEARCH CAPABILITY

Animal Ecology & Evolution

Facing the challenges of altered
environmental conditions



Acknowledgement

Western Sydney University acknowledges the peoples of the Darug, Tharawal, Eora and Wiradjuri nations. We acknowledge that the teaching, learning and research undertaken across our campuses continues the teaching, learning and research that has occurred on these lands for tens of thousands of years.

Researchers

To contact HIE Plants, Animals and Interactions Theme scientists, please go to:
www.westernsydney.edu.au/hie/research/plants,_animals_and_interactions

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Innovative research from genes to ecosystems

Animals are a fundamental element of all ecosystems, defining many key characteristics of natural and managed environments.

Understanding how biotic and abiotic components of animal interactions with the environment occur is key to understanding ecosystems. This information allows us to predict future adaptation ability under altered climatic conditions.



Research topics

Hawkesbury Institute for the Environment researchers have expertise in complementary areas of eco-physiology, evolutionary ecology and species interactions.

For laboratory and field-based research, our researchers use a combination of our unique experimental facilities and natural environmental gradients.



Conservation, management and planning



Evolutionary ecology



Species, populations and community dynamics



Molecular and metabolic adaptation



Chemical ecology



Ecophysiology



Spatial ecology and behavioural sciences



Impacts of environmental and climate change



RESEARCH DIRECTIONS

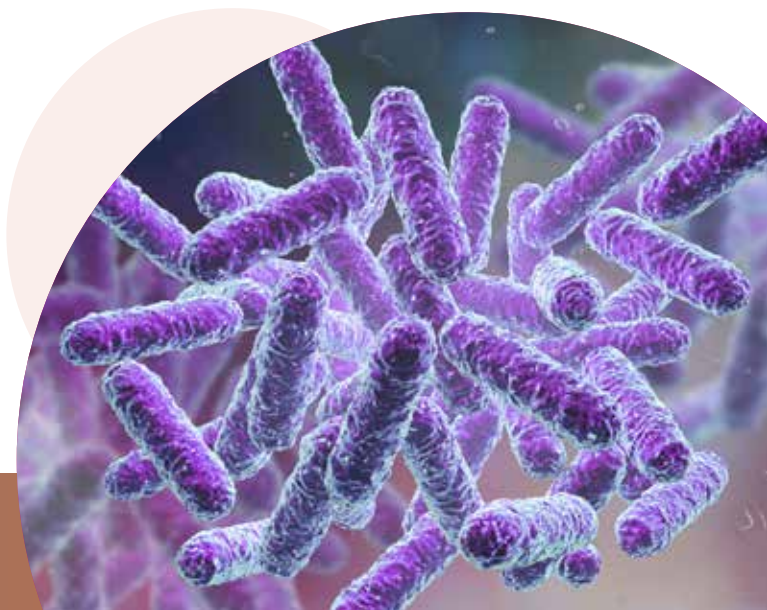
Koala microbiome

Eucalyptus leaves contain chemical defences that can be toxic to animals when unfamiliar, resulting in the death of almost 40 percent of relocated koalas.

Using DNA analysis to investigate the microbial communities in the digestive systems of koalas, our researchers developed a faecal inoculation made from the excrement of koalas at relocation sites to prepare koalas before being moved. Inoculating them with faecal microbes also improves outcomes for koalas who require rehabilitation from bushfire or road accidents.

Environmental change is a pervasive and growing threat to ecosystems and biodiversity.

Our researchers aim to understand the patterns and underlying processes that define the vulnerability or persistence of species to inform and develop conservation and management strategies for the future.





Vulnerability of Australian wildlife to disease



As an island nation, Australia's unique wildlife are inherently at risk from invasive novel pathogens. Our researchers are working to quantify the potential risk of exposure of one of these pathogens on our native bat population. We are producing mechanism-based, predictive models of vulnerability for these populations across south-eastern Australia to prevent, detect, and mitigate the impacts of disease on our wildlife.

White nose syndrome is caused by a fungal pathogen capable of decimating bat populations. Many Australian bat species, which make up around a quarter of all Australian mammal species, would face a devastating threat to their survival if this fungal pathogen was introduced into Australia.

Up to eight bat species occupy caves in south-eastern Australia that provide conditions suitable for the fungus to grow, and all caves occupied by the critically endangered southern bent-winged bat provide ideal thermal conditions for white-nose syndrome.



Image credit – J. Welbergen

The critically endangered Christmas Island Flying Fox

The Christmas Island flying fox is the last remaining native mammal persisting on Christmas Island. Their decline has serious implications for the unique ecosystems of this remote part of Australia, which has already seen the extinction of several native species. Our researchers are working with a multidisciplinary team to assess and identify the reasons for the Christmas Island flying fox decline and develop a plan for their management and recovery.

Understanding the social organisation and population structure of the Christmas Island flying fox, along with their habitat use, thermoregulation mechanisms, and the infectious diseases affecting them, contributes to the development of better informed strategies for successful management interventions.

Image credit – Leonardo Mercon, Alamy





Image credit – Vanessa Stebbings

RESEARCH DIRECTIONS

Communication and sociability of Ghost Bats

Our studies show that many bats have a range of vocalisations including elaborate songs used for territoriality and mate attraction. As a highly vocal and social species, the ghost bat is an ideal species to study communication and sociability.

Research into ghost bat vocalisations utilising new technological acoustic and video surveillance improves current monitoring of this vulnerable species.



RESEARCH DIRECTIONS

Biology, ecology and conservation of Australian birds - The Albert's Lyrebird

The Albert's lyrebird is a charismatic and elusive threatened species that is only found in a small region of subtropical rainforest in the mountainous areas of Bundjalung Country, on the border between NSW and Queensland.

Male Albert's lyrebirds perform spectacular dance displays on constructed platforms and produce an astounding mimicry of sounds.

Previous research has found geographic variation in their vocalisations, but patterns and drivers of variation have not been quantified, and there have been no systematic descriptions of their visual displays.

To aid in its conservation, our researchers are collaborating with external researchers to quantify geographic variation of lyrebird displays, providing important information on drivers of variation in avian communication and aiding the cultural conservation of this charismatic bird.



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We invite researchers and investors to explore
future opportunities to work with the
Hawkesbury Institute for the Environment.

Hawkesbury Institute for the Environment

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