

# Climate change could wipe out Australian mammals

June 5 2015, by Rebecca Tucker

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Australian native animals could be under threat of extinction from climate change, with a unique longitudinal study by Deakin University scientists finding our small mammal populations are suffering the ravages of long-term low rainfall conditions and intense wildfires.

The findings are the result of an ongoing investigation into the impact of major bushfires in the Grampians National Park in 2006, 2013 and 2014. The major project is today being recognised for its outstanding contribution to understanding protected areas with the Parks Victoria's Nancy Millis Science in Parks Award.

Lead researcher, Associate Professor John White, said the research team was proud to win the award, which was recognition of the important and collaborative work between Deakin University and Parks Victoria investigating the impact of [climate change](#) and fire on the state's landscape.

"This research has important consequences beyond the Grampians, with the findings likely to apply to much of south eastern Australia, providing an insight into how our native ecosystems are being impacted by changing [climatic conditions](#)," Associate Professor White said.

The research team also includes Dr Raylene Cooke and Dr Dale Nimmo, from Deakin's Centre for Integrative Ecology, within the School of Life and Environmental Sciences.

The group began their examination of the small mammal community at 36 sites across the Grampians in 2008, two years after a major wildfire burnt almost half of the national park.

Mammals examined include rats and mice such as the native threatened heath mouse and swamp rat, several small carnivorous marsupials including several species of antechinus, and larger marsupials including the southern brown bandicoot.

"We started out with short-term questions about how mammals recovered from extensive and devastating wildfires." Associate Professor White said.

"We were shocked by how few native small mammals there were in our sites in 2008. Suddenly it became critical to continue monitoring to see what happened: did the mammals recover? What role would rainfall have on recovery?"

"Rapidly the project formed into a long-term project looking at how biodiversity responds to major fluctuations in climatic conditions (i.e. rainfall) and wildfires across an iconic Victorian landscape.

"We were fortuitous, in a sense, that the Grampians suffered another natural disaster this time floods in late 2010 early 2011, which came against a background of well below average rainfall.

"Bang: all of a sudden in 2011 and particularly in 2012 we saw an explosion of native small mammals across the landscape with species such as the heath mouse booming."

But Associate Professor White said unfortunately the rainfall crashed back into a sequence of being well below average, and the mammal populations did the same, crashing across the 36 sites."

Associate Professor White said the team was surprised by how intrinsically linked to rainfall the small mammal numbers were in the Grampians.

"In effect the small mammals in the Grampians were responding to fire and rainfall patterns in a way far more reflective of Australian arid zone ecosystems," he said.

"If this is the case we may need to start thinking of ecosystems such as the Grampians as being arid, and starting to manage aspects like fire in context of the underlying climatic conditions. We will potentially see the loss of species if they cannot find refuges in the landscape to survive in during the long, protracted periods of below [average rainfall](#)."

The research team, which has so far included four research staff, 13 honours students and now a PhD student, are also utilizing satellite imagery to try to establish where these drought refuges may exist in the landscape.

Associate Professor White said many [small mammals](#) have been linked to improving the health of ecosystems. When the mammals decline or disappear from the forests and heathlands of areas such as the Grampians, there must be a subsequent modification to the health of the ecosystem as a whole.

"Long-term ecological research such as this is so rare in Australia, but the information it yields on how ecosystems respond to aspects such as climatic variation and fire are priceless," he said.

"What we have seen in the Grampians in the last eight years offers us an insight into what we may expect to see in a future dominated by changing climatic conditions."

Provided by Deakin University

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