



# Terrestrial Research E-bulletin

## Convener's Update

Welcome to a new year and the February issue of the TRE-bulletin.

With an election and potentially large changes ahead, 2013 will be an interesting year in the climate change space. For the Terrestrial Biodiversity network, funding will cease in June. However the resources and information compiled by the network will continue to be maintained on the [network website](#).

Over the next four months we will be compiling information from all of the activities carried out by the network during the last four years. The information will include one page summaries of the six network funded workshops. These workshops were:

- ◆ Conservation planning for climate change.
- ◆ Genetic Translocation: insuring against extinction and increasing local adaptation?
- ◆ Assisted migration: Preparing for climate change: who when, where, how and why?
- ◆ Riparian ecosystems and climate change – vulnerabilities, impacts and adaptation.
- ◆ Hard decisions and soft options: Developing a decision framework for adaptation of urbanised Australian estuaries to climate change that considers both property protection and ecosystem values.
- ◆ Bushfires, biodiversity and climate change: Developing an adaptive management framework to understand the efficacy of fire management interventions in Australian flammable ecosystems in a warming world.

The network will also continue to compile and complete student reports, report card publication, information sheets and adaptation case studies, on-line must reads and downloadable resources.

As these summaries become available, network members will be notified. Over the next few months we will also investigate ways in which information can still be sent to members after the completion of the network so that the capacity is not lost.

In this edition, we feature short summaries of three of the workshops mentioned previously, as well as an article on CliMAS climate maps and regular Must-Read and Conference Update sections.

### Steve Williams & Lesley Hughes



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### Meet the Steering Committee

#### Prof David Bowman

David Bowman is a Professor of Environmental Change Biology at the University of Tasmania. He is motivated to understand the coupling between



humans and environmental change in the past, present and future, with a concentration on landscape fire. Bowman's intellectual quests would be impossible were it not for expertise of numerous collaborators working across a spectrum of the environmental and biological sciences.

# Climate Maps for Australian Species by the eResearch Team, James Cook University.

The Centre for Tropical Biodiversity and Climate Change and the eResearch Centre at James Cook University have just completed a suite of tools called CliMAS.

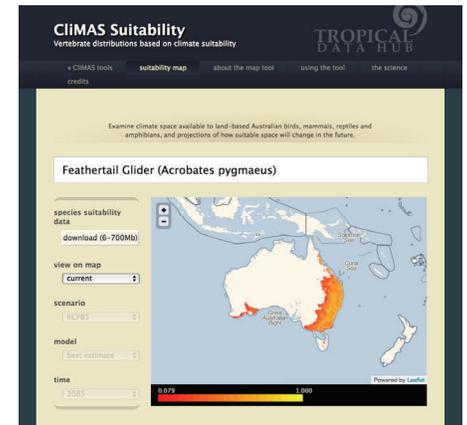
CliMAS is designed to address the general lack of engagement and knowledge transfer between professional researchers and end-users of research (general public, conservation managers, decision-makers, etc.) about the impacts of future changing climates on biodiversity. While many researchers have begun to make the results of their research public, there is a scarcity of online tools that display species distribution data. The CliMAS site provides tools that can utilise data available from the Atlas of Living Australia (ALA) and the Tropical Data Hub (TDH) to allow a broad range of end-users to explore the potential impacts of climate change on terrestrial vertebrate species in Australia.

The CliMAS tools aim to inform end-users of the potential impact on climate change on the biodiversity of Australian terrestrial vertebrates in a manner that makes the information relevant to them. The information is presented from three different viewpoints:

**CliMAS Suitability:** Species viewpoint – for those users with an interest in particular individual vertebrate species;

**CliMAS Biodiversity:** Group viewpoint – for those users interested in impacts on a particular genus, family or taxa; and

**CliMAS Reports:** Region viewpoint – a report-style summary of climate and species impacts for those users with an interest in a geographical/management area.



Screenshot showing the CliMAS suitability map for the Feathertail Glider.

A video, featuring Prof Steve Williams (Director of the Centre for Tropical Biodiversity and Climate Change), that summaries the functionality and application of the tools has been released on YouTube: <http://www.youtube.com/watch?v=wt3TOeVvQSO>

This project was supported by the [Australian National Data Service \(ANDS\)](#) through the National Collaborative Research Infrastructure Strategy Program and the Education Investment Fund (EIF) Super Science Initiative, and the [Queensland Cyber Infrastructure Foundation](#).

## Terrestrial Adaptation Focus Workshops and Outputs

### Genetic Translocation: Ensuring against extinction and increasing local adaptation workshop.

This workshop took place on 28th - 31st March in 2010 in Melbourne and was convened by Prof. Ary Hoffman and Dr. Carla Sgro. Participants explored the potential of genetic translocation as a conservation tool under climate change. Situations where the benefits of genetic translocation might be realised, as well as situations where there might be risks associated with genetic translocation, were discussed at length and it was agreed that these issues needed to be considered within a risk assessment framework on a case-by-case basis, and this idea formed the impetus for the primary manuscript stemming from the workshop.

A paper was published in *Evolutionary Applications* as a result of this workshop. The article provides a classification of translocations based on specific genetic goals for both threatened species and ecological restoration. It also describes a framework for assessing the genetic benefits and risks associated with translocations and provides guidelines for managers focused on conserving biodiversity. Case studies are developed to illustrate the framework.

*Weeks et al. (2011) [Accessing the benefits and risks of translocations in changing environments: a genetic perspective](#). *Evolutionary Applications*, Volume 4, Issue 6 (Open access free download)*

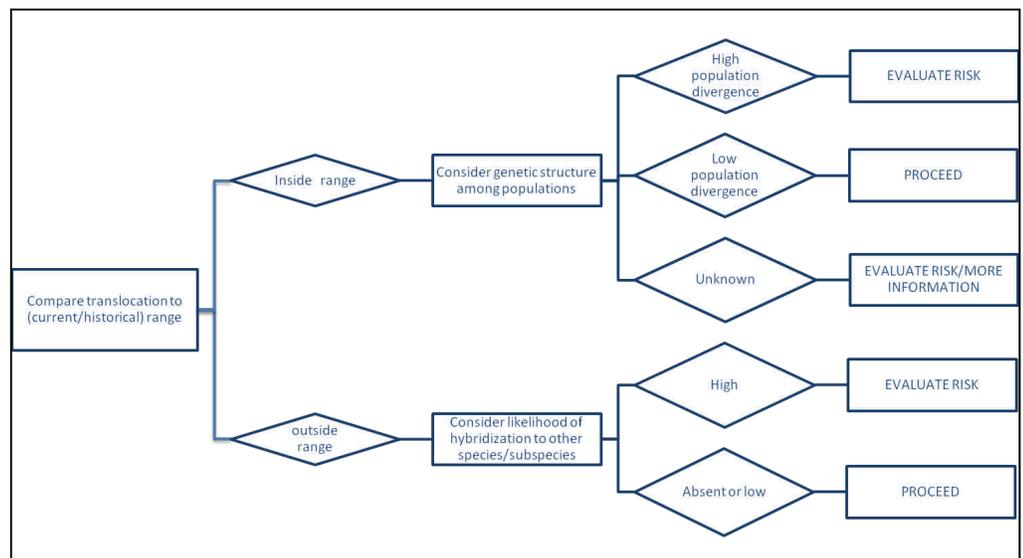


Figure: Simplified decision tree for determining whether to proceed or assess risk in translocation (Figure from *Evolutionary Applications*, Vol 4, Issue 6.)

## Dynamic conservation planning in a changing climate

This workshop took place on 9-13<sup>th</sup> of November 2009 in the Daintree region of North Queensland. It was convened by Prof. Bob Pressey and Prof. Steve Williams and was focused on dynamic conservation planning for maintaining biodiversity under uncertain future global climate scenarios. The workshop was attended by 15 scientists from an array of backgrounds and institutions. Workshop participants were posed with the question: 'What does current conservation planning NOT do, which it should do better, to deal with climate change?' In response, attendees framed outlines for a manuscript which reviewed current and future directions for dynamic conservation planning,

This paper has recently been published, open access, in *Climatic Change*. The paper provides a much needed decision framework for actions and decisions aimed at conserving biodiversity under climate change, from ongoing conservation actions in existing refugia to assisted colonization and ex-situ breeding and conservation programs.

*Shoo et al (2013) Decisions for managing biodiversity under climate change. Climatic Change (in press, open access and free download)*

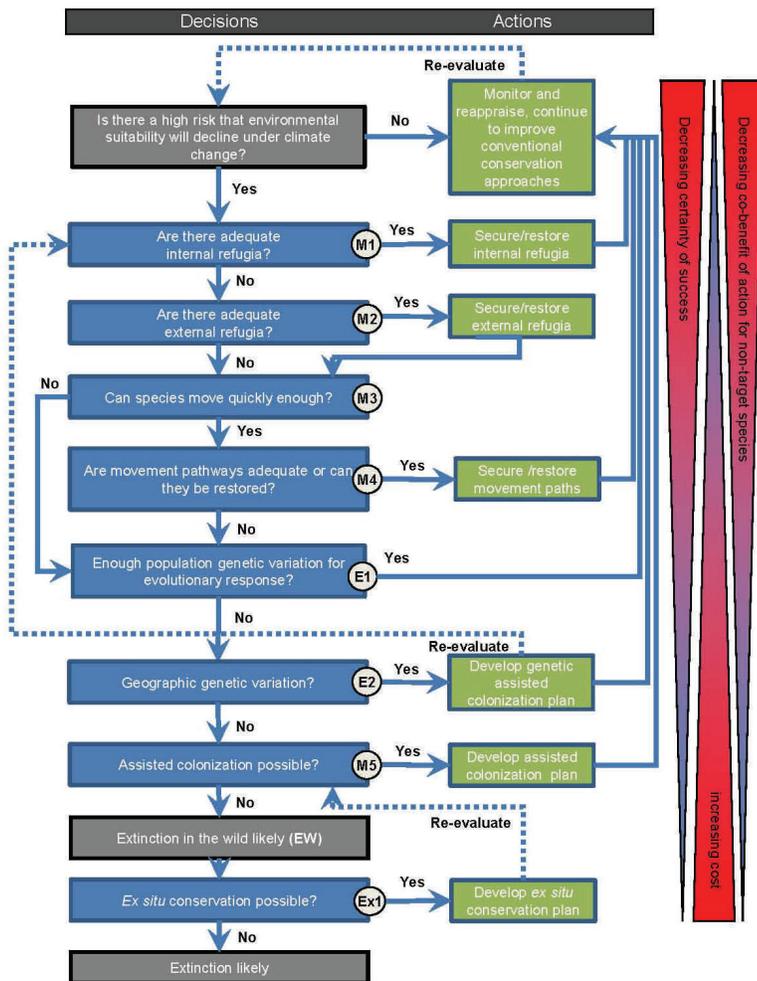


Figure: Decision framework for management decisions and actions. Figure from *Climatic Change (in press)*.

## Bushfires, Biodiversity and Climate Change workshop.

This workshop took place in Hobart, on 21st - 25th May 2012 and was convened by Prof. David Bowman and Dr Dick Williams. It's primary goal was to develop an adaptive management framework to understand the efficacy of fire management interventions in Australian flammable ecosystems under climate change. Participants were asked to identify key threatening processes in the interactions between climate change, fire and biodiversity and to develop an adaptive management framework for fire and biodiversity in Australia under global warming conditions.

Workshop participants have produced a brochure aimed at end-users within fire and land management organizations. The publication outlines the concept of fire countries and highlights the challenges in the fire, biodiversity and climate change nexus. The foundations of an adaptive management framework for monitoring the impacts of management, changing fire regimes and climate change on biodiversity is also described.

The main publication for this workshop, so far, has been a meeting report in *New Phytologist*: Williams, R & Bowman, D. (2012) [Fire futures for a megadiverse continent](#). *New Phytologist*.

Convenor David Bowman also published an article in *The Conversation* as a result of this workshop, which can be found [here](#).

Convenors will also take the lead in producing another paper, currently in draft form, that includes contributions from all participants.



Participants of the Bushfires workshop, held in Hobart.



## Must Read:

Hot off the press— papers and reports on climate change adaptation

- ◆ **Evidence of current impact of climate change on life: a walk from genes to the biosphere.** (2013) Peñuelas et al. *Global Change Biology*. This review examines how organisms are adapting, or not, to climate change, from altered gene expression to changes in physiology, phenology and growth and reproduction. DOI: 10.1111/gcb.12143
- ◆ **Red noise increases extinction risk during rapid climate change.** (2013) Mustin et al. *Diversity and Distributions*. The authors investigate how environmental noise can impact on models of extinction risk for organisms under rapid climate change. DOI: 10.1111/ddi.12038.



## Opportunities

- ◆ **Call for Expressions of Interest - Delivering NSW Climate Change Adaptation Research** The Office of Environment and Heritage (OEH) will be establishing a NSW Adaptation Research Hub in 2013 with universities and research institutions specialising in climate impacts and adaptation research. A call for Expressions of Interest can be found here: <https://tenders.nsw.gov.au/oeh/?event=public.home>

## Conference Update

- ◆ INTECOL 2013. 18-23rd August 2013, London, UK **Abstracts due March 22 2013.** <http://www.intecol2013.org/>
- ◆ Impacts World 2013: International conference on climate change effects. May 27th - 30th 2013, Potsdam, Germany **Abstract submission closed.** <http://www.climate-impacts-2013.org/>
- ◆ Greenhouse 2013. 8th - 11th October 2013 18-19th July 2013. Adelaide, Australia. **Abstracts due 24 May 2013.** <http://www.greenhouse2013.com/>



## About the Adaptation Research Network for Terrestrial Biodiversity

The Adaptation Research Network for Terrestrial Biodiversity is one of eight Research Networks administered by the National Climate Change Adaptation Research Facility - [www.nccarf.edu.au](http://www.nccarf.edu.au).

It is hosted by James Cook University in Townsville.



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To subscribe to our Network - <http://nccarf.jcu.edu.au/terrestrialbiodiversity/index.php/register>

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