



## About us

At the Arthur Rylah Institute for Environmental Research our terrestrial ecology teams produce high-quality science to support evidence based decision-making by governments and communities.

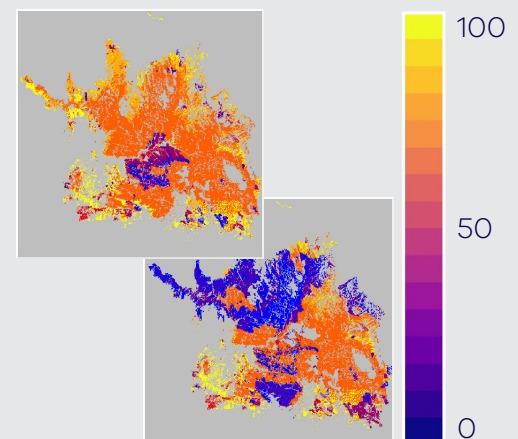
Our growing number of scientists have extensive expertise in fauna and flora research, ecological modelling and data interpretation. We work collaboratively with national, state and local agencies, universities and the community.

## FAME – A new tool supporting fire management

Plans to conduct burning require information on the impacts of fire on flora and fauna. However, issues with timely access to relevant information has hampered effective fire planning for biodiversity. ARI's Josephine MacHunter and Nevil Amos, along with collaborators at the University of Melbourne and La Trobe University, have developed a tool 'Fire Analysis Module for Ecological values (FAME)' for use by fire planners.

FAME can be used to show flora and fauna responses to fire in a landscape over time and space. This enables fire planners to easily evaluate the impacts of alternative fire regimes on a species. Fire planners are using FAME to support fire management planning across Victoria. The continued use of this tool will facilitate more effective and clear consideration of ecological values in strategic fire management decisions.

FAME was recently awarded the **2019 DELWP Forest Science Award**.



Sample output from FAME showing change in relative abundance (0-100) following fire for the Yellow-bellied Glider between 2005 and 2010

## News

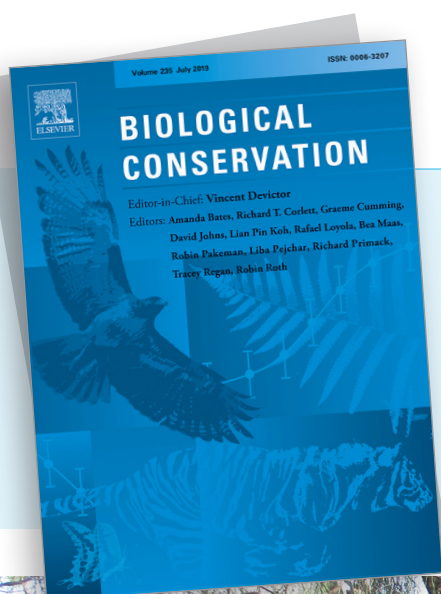
### Public service medals for two ARI scientists

**Lindy Lumsden** and **Peter Menkhorst** were awarded the Public Service Medal in this year's Queen Birthday Honours List to recognise their dedication to the conservation of Australian biodiversity.

*Congratulations to Lindy and Peter.*



*Lindy Lumsden and Peter Menkhorst*



### ARI scientist newest editor of Biological Conservation journal

Steve Sinclair joins a growing number of ARI scientists that hold editorial roles for national and international science journals. Through these roles ARI is helping to advance the field of biodiversity conservation and management locally, nationally and internationally.

### ARI contributes to two new ARC linkage grants

Tracey Regan is an investigator on two recently announced Australian Research Council (ARC) Linkage projects:

- **Ecosystem Risk Assessment: new solutions to the global biodiversity crisis**
- **A global standard for the status of Wetlands of International Importance**

These international collaborative research projects will tackle challenges in ecosystem risk assessment and management under a changing climate. They will focus on threatened alpine and wetland ecosystems. The projects will provide timely advice to state and national governments in managing threatened ecosystems into the future and meeting their obligations under the Ramsar Convention.



## Influencing Change

### Optimising habitat management for amphibians

Knowing where and when to create habitat for threatened species is a key requirement for conservation but is difficult to do. Habitat managers face the problem of choosing how to invest limited resources to maximize the likelihood of species persistence.

ARI's Michael Scroggie and Geoff Heard collaborated closely with conservation managers to develop a solution that combines optimization techniques with a metapopulation model as part of the **Melbourne Strategic Assessment Program**. This approach is being used to identify where and when artificial wetlands should be constructed to benefit the threatened Growling Grass Frog (pictured). Wetland construction informed by these analyses is starting very soon.

This work helps solve a conservation problem with millions of potential solutions.



An adult female Growling Grass Frog.



### Monitoring the outcomes of revegetation

Tim O'Brien, La Trobe scientist Sacha Jellinek and ARI / La Trobe University co-appointment Andrew Bennett are trialling a simple revegetation monitoring protocol. The aim is to harness the power of citizen science in combination with Catchment Management Authorities, Landcare groups and other non-government organisations such as Greening Australia to assess the outcomes of revegetation activities in Victoria.

It is envisaged that the data produced will be used to gain a better understanding of how revegetation planting success varies between plant species, how it varies between sites, the factors that influence planting success, and how revegetation might be more effective in the future.

### Restoration thinning to recover Box-Ironbark forest

In partnership with Parks Victoria, ARI's Geoff Brown and Arn Tolsma conducted an experiment to understand how patterns of tree thinning affect tree growth in Box-Ironbark forests.

These forests have experienced widespread decline in extent and wildlife habitat (e.g. hollows and large woody debris) and require active management to restore habitat.

The study highlights that thinning may be an important management tool for accelerating the speed of forest growth and developing desirable wildlife habitat.



Stand of Box-ironbark

## Influencing Change

## Feature publications

**Scroggie, M. P.**, Preece, K., Nicholson, E., McCarthy, M. A., Parris, K. M. and **Heard, G. W.** (2019), Optimizing habitat management for amphibians: From simple models to complex decisions. *Biological Conservation*, 236, p 60–69.

<https://doi.org/10.1016/j.biocon.2019.05.022>

**Farmilo, B. J.** and **Moxham C.** (2019), Decadal plant composition changes in grazed native grassland. *Ecological Management and Restoration* (early online).  
<https://doi.org/10.1111/emr.12383>

**Moxham, C.**, **Kenny, S.A.**, **Sutter, G.**, **Cameron, D.**, ... (2019), *Pluchea rubelliflora* and *Pterocaulon sphacelatum* (Asteraceae): new to Victoria's semi-arid floodplains. *Muelleria*, 32, p 119–126.  
<https://www.rbg.vic.gov.au/science/publications/muelleria/muelleria-vol.-37>

**Collins, L.**, **Bennett, A. F.**, Leonard, S. W. J., and Penman, T. D. (2019), Wildfire refugia in forests: severe fire weather and drought mute the influence of topography and fuel age. *Global Change Biology* (early online).  
<https://doi.org/10.1111/gcb.14735>

Hradsky, B. A., Kelly, L. T., **Robley, A.**, and Wintle, B. A., (2019), FoxNet: An individual-based model framework to support management of an invasive predator, the red fox. *Journal of Applied Ecology*, 56, p 1460–1470.  
<https://doi.org/10.1111/1365-2664.13374>

Norberg, A., **Newell, G.**, ... **White, M.**, and Ovaskainen, O., (2019), A comprehensive evaluation of predictive performance of 33 species distribution models at species and community levels. *Ecological Monographs* (early online).  
<https://doi.org/10.1002/ecm.1370>

La Marca, W., ... **Regan, T. J.**, .... (2019), The influence of data source and species distribution modelling method on spatial conservation priorities. *Diversity and Distributions*, 25, p 1060–1073.

<https://doi.org/10.1111/ddi.12924>

Dorrough, J., **Sinclair, S. J.**, and Oliver, I., (2019), Expert predictions of changes in vegetation condition reveal perceived risks in biodiversity offsetting, *PLOS ONE* 14, e0216703.

<https://doi.org/10.1371/journal.pone.0216703>

Forsyth, D.M., **Ramsey, D.S.L.**, and **Woodford, L.P.** (2019) Estimating abundances, densities, and interspecific associations in a carnivore community. *The Journal of Wildlife Management* (early online).  
<https://doi.org/10.1002/jwmg.21675>

**Harrisson, K.A.**, Magrath, M.J., Yen, J.D., Pavlova, A., Murray, N., Quin, B., **Menkhorst, P.**, Miller, K.A., Cartwright, K. and Sunnucks, P., 2019. Lifetime fitness costs of inbreeding and being inbred in a critically endangered bird. *Current Biology*, 29, p 2711–2717.

<https://doi.org/10.1016/j.cub.2019.06.064>

Atkins, Z., Amor, M., **Clemann, N.**, ..., **Harrisson, K.**, Schroder, M., and Robert, K. (2019). Allopatric divergence drives the genetic structuring of an endangered alpine endemic lizard with a sky-island distribution. *Animal Conservation* (early online)  
<https://doi.org/10.1111/acv.12519>

Scheele, B.C., Foster, C.N., Hunter, D.A., Lindenmayer, D.B., Schmidt, B.R. and **Heard, G.W.** (2019). Living with the enemy: facilitating amphibian coexistence with endemic chytridiomycosis. *Biological Conservation* 236, p 52–59.  
<https://doi.org/10.1016/j.biocon.2019.05.032>

## Knowledge transfer

## ARI seminars:

'Sixteen years of Growling Grass Frog research on Melbourne's urban fringe; where to next?' (Geoff Heard)

'Hairpin Banksia persistence – fire interval, fire severity or weather?' (Annette Muir)

'Are eucalypt forests resilient to regimes of frequent high severity fire?' (Luke Collins)

## Other presentations:

**DELWP:** 'Koalas in Victoria – the basics' (Peter Menkhorst)

**Biodiversity Across Borders Conference:** 'The changing status of the Greater Glider in Victoria' (Jenny Nelson)

**Australian Mammal Society Conference:** 'Broadscale surveys for Leadbeater's Possums reveal widespread occurrence' (Jemma Cripps)

**Statewide Biodiversity Forum:** 'Recent Greater Glider surveys in the Central Highlands' (Louise Durkin)

**Landcare Facilitators:** 'Turtle Research in Victoria' (Katie Howard)

**DELWP:** 'Are we moving threatened species in the right direction?' (Nick Clemann)

**DELWP:** 'Strategic Management Prospects: supporting strategic investments in conservation actions' (Jim Thomson)

**Mallee CMA:** 'TLM Intervention Monitoring Hattah Lakes Vegetation Program' (Claire Moxham)

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