ARI Terrestrial Quarterly Update

December 2018

About us

The Arthur Rylah Institute's terrestrial ecology teams produce high-quality science to support evidence based decision-making by governments and communities.

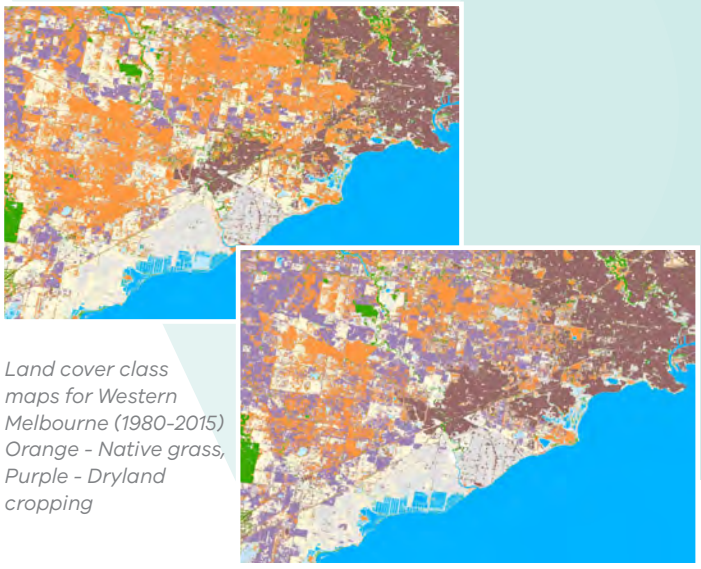
Our 45 scientists have extensive expertise in fauna and flora research, ecological modelling and data interpretation. We work collaboratively with national, state and local agencies, universities and the community.

Native Vegetation Extent Time Series

Matt White, Pete Griffioen and Graeme Newell from the Ecological Analysis and Synthesis team recently developed a modelling tool which produces a time series (1980-2015 in 5-year increments) of native vegetation extent and land cover across Victoria. This builds on a similar product developed by ARI in 2017 for South Australia.

The time series tool replaces the laborious process of field-based data collection and photographic interpretation.

This tool, based on satellite images, provides timely, consistent and cost-effective information on changes in native vegetation such as required for State of Environment reporting.



Land cover class maps for Western Melbourne (1980-2015) Orange - Native grass, Purple - Dryland cropping

Arthur Rylah Institute for environmental research

VICTORIA State Government | Environment, Land, Water and Planning

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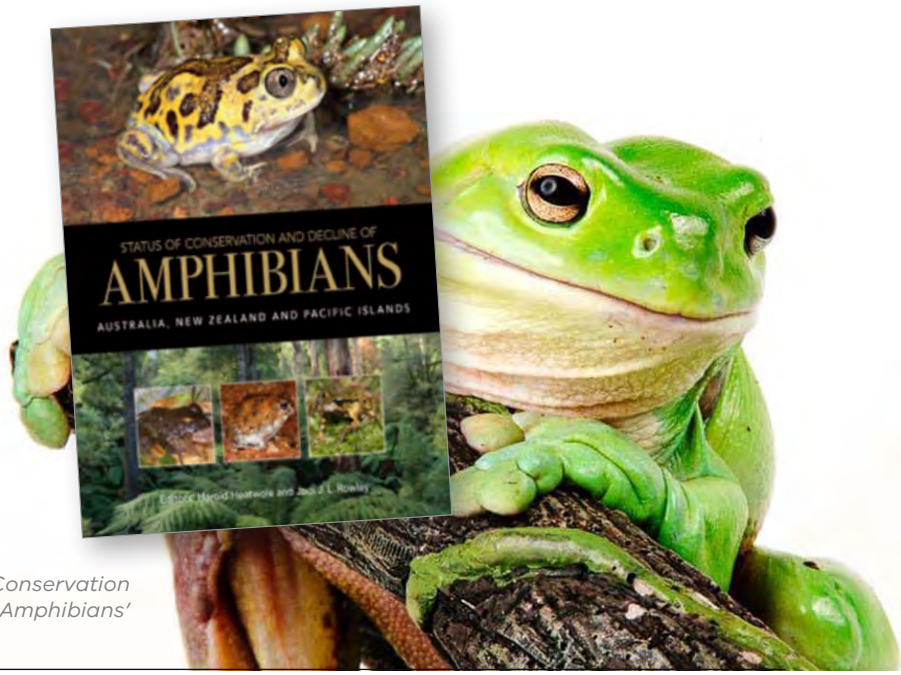
Influencing Change

'Status of Conservation and Decline of Amphibians'

Nick Clemann has contributed to a recent book that enhances the current understanding of the conservation status of amphibians.

The book aims to stimulate research into halting amphibian declines and provide a better foundation for making conservation decisions.



Cover of 'Status of Conservation and Decline of Amphibians'

OUTBREAK v 2.0

OUTBREAK v 2.0 is a software program designed to assess the effects of infectious disease on population viability. Carlo Pacioni is the lead author of the user manual for this software which forms part of the **Species Conservation Toolkit Initiative** (IUCN SSC Conservation Planning Specialist Group) intended for use around the world.

This software ensures species population models are based on the most informative inputs to improve conservation outcomes.

OUTBREAK v 2.0 User's Manual

National Reference Library of Expert Site Condition Assessments

Matt White and Steve Sinclair from the Ecological Analysis and Synthesis team are collaborators on this CSIRO project.

The project will ask experts to do site-level ecological assessment, to inform Australia's first national assessment of habitat condition.

Influencing Change

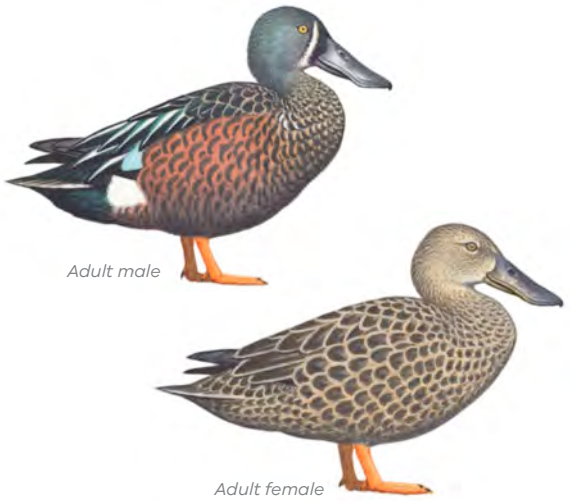
Waterfowl Aging and Sexing Guide

Danny Rogers, Peter Menkhorst and Jeff Davies (consultant artist) have produced a new guide to help hunters identify the age and sex of waterfowl.

This guide, funded by the Game Management Authority will help improve hunters' identification of age and sex of game species which will improve the accuracy of their reporting. The improved estimates of sex and the age structure of game species will inform better management in Victoria.

The sex and age of waterfowl can be determined from observations on plumage by using these new identification features.

The guide describes eight species of duck and the Stubble Quail, and includes newly commissioned taxonomic paintings.



AUSTRALASIAN SHOVELER (Spatula rhynchotis)
Commissioned paintings of waterfowl for the new guide

Modelling to support recommendations for the Victoria Environment Assessment Councils

The Ecological Analysis and Synthesis team provided valuable input to the VEAC Central West Investigation Draft Proposals Paper, now out for comment. The team used habitat distribution models of Victorian rare and threatened species (255 vascular plants and 74 vertebrates) and vegetation data to identify high priority areas of threatened species habitat within the Central West Investigation area. These priority areas highlight opportunities to maximise habitat for threatened species on public land currently outside protected areas.

Cover of the report and map showing priority areas for threatened species

Lindsay-Mulcra Islands Black Box Tree Health and Regeneration

The Vegetation Ecology team has documented the role of flooding on populations of Black Box, a dominant floodplain tree.

The project found that flooding was important for maintaining healthy Black Box tree populations and is being used by the Mallee CMA as a management tool for restoration of floodplain vegetation communities.

Influencing Change

DELWP's Forest Protection Survey Program

This program is surveying areas of public-owned forest to check for the presence of threatened or key forest-dependent species which have protection prescriptions.

ARI teams are completing surveys that focus on numerous species of threatened plants, Spotted-tail Quoll, Leadbeater's Possum, fish and crayfish.

The program will inform forest management planning decisions and improve environmental protections and outcomes for threatened species management.

Forest protection surveys. Pictured: ARI Ecologists

Feature publications

Hunter, D., **Clemann, N.**, et al., 2018. 'Frog declines and associated management response in south-eastern mainland Australia and Tasmania'. In H. Heatwole, J. Rowley (eds) *Status of Conservation and Decline of Amphibians: Australia, New Zealand and Pacific Islands*. CSIRO Publishing, pp.39-58.
https://www.publish.csiro.au/book/7783/

Collins, L., **Griffioen, P.**, **Newell, G.** and Mellor, A., 2018. The utility of Random Forests for wildfire severity mapping. Remote Sensing of Environment, 216, pp.374-384.
https://doi.org/10.1016/j.rse.2018.07.005.

Liu, C., **Newell, G.** and **White, M.**, 2018. The effect of sample size on the accuracy of species distribution models: considering both presences and pseudo-absences or background sites. Ecography (early online).
https://doi.org/10.1111/ecog.03188

Ferreira, J., Lennox, G.D., Gardner, T.A., **Thomson, J.R.**, Berenguer, E., Lees, A.C., Mac Nally, R., Aragão, L.E., Ferraz, S.F., Louzada, J. and Moura, N.G., 2018. Carbon-focused conservation may fail to protect the most biodiverse tropical forests. Nature Climate Change, 8, pp.744–749
https://doi.org/10.1038/s41558-018-0225-7

Geyle, H.M., ... **Menkhorst, P**, et al., 2018. Quantifying extinction risk and forecasting the number of impending Australian bird and mammal extinctions. Pacific Conservation Biology, 24, pp.157-167.
https://doi.org/10.1071/PC18006

Moxham, C., **Duncan, M.** and **Moloney, P.**, 2018. Tree health and regeneration response of Black Box (*Eucalyptus largiflorens*) to recent flooding. Ecological Management & Restoration, 19(1), pp.58-65.
https://doi.org/10.1111/emr.12288

Knowledge transfer: some recent presentations and workshops

DELWP Connecting Communities – Southern Right Whales Photo ID (Kasey Stamation),
DELWP Biodiversity On Ground Action workshop – Alpine bogs in the Cobungra State Forest (Arn Tolsma),
– Looking for nest boxes in Victoria (Phoebe Macak),
Corangamite CMA Forum – Weed control in Victorian Volcanic Plains grasslands (Brad Farmilo),
Deakin University Seminar – Victorian reptiles and frogs in a time of mass extinction (Nick Clemann),
Australian Mammal Society Conference – Estimating the density of Greater Gliders (Jemma Cripps),
Parks Victoria Workshop (Mallee) – Condition monitoring of semi-arid woodland (Sally Kenny),
Trust for Nature (Vic) – Button Wrinklewort in Gippsland (Steve Sinclair),
Wimmera Biodiversity Seminar – Mammal and Bird Treasures of the Lowan Mallee (Peter Menkhorst).