



Southern Bent-wing Bats, Terry Reardon

## 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 50 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.

## Innovations from the bat cave

Microbats are nocturnal, making them difficult to see, hear and therefore monitor. To study them, ARI researchers Dr Lindy Lumsden and Amanda Bush use a wide range of innovative approaches and technologies.

To estimate population numbers of cave-dwelling bat species without disturbing them, they use [thermal and infrared cameras](#) to film them in their roosts and when flying out on dusk. Automated, motion-tracking software is then used to count the number of individuals in flight. Using this approach, they are monitoring the critically endangered Southern Bent-wing Bat in south-western Victoria, to track population trends over time and inform the protection of these bats and their roosting sites.

Another method, used for many years to determine the presence of various microbat species, uses ultrasonic detectors to record the high frequency echolocation calls they make. These can be set for several months to monitor populations, recording millions of calls to be later identified to species. These innovations are enabling ARI researchers to better understand these important, yet poorly known species, to guide their conservation and management.

[Discovering the secrets of Victoria's small bats \(ari.vic.gov.au\)](https://ari.vic.gov.au)

[The tiny southern bent-wing bat is facing extinction](#)  
(ABC Radio with Jacinta Parsons)

[Did the southern bent wing bat win mammal of the year?](#)  
(ABC Radio with Jacinta Parsons)

[One of Australia's tiniest mammals is heading for extinction – but you can help](https://theconversation.com) (theconversation.com)







## ARI's 'Bogologist' retires!

Dr Arn Tolsma from ARI's Community Ecology team is hanging up his field boots after 20 years.

Arn joined ARI in 2002 after completing his PhD on the effects of fire and grazing on alpine plants. His work at ARI assessing the condition of burnt and grazed alpine bogs on the Bogong High Plains helped contribute to the Victorian government's decision to remove cattle from the Alpine National Park in 2005, for which Arn and his colleagues received the Secretary's Award for outstanding achievement.

Arn's alpine fire work continued over the years, with condition and management assessments undertaken following large fires in 2007, 2009 and 2020, and several smaller ones in-between. He quickly became the 'go to' man for advice on bog condition, threats and management actions in different regions. Much of the work being done across the alps by land managers is based on his recommendations, including fire protection, rehabilitation, fencing, removal of willows, control of feral animals and various monitoring programs. Arn's extensive reconnaissance work also underpinned on-going [mapping of alpine bogs](#) across the high country, and the alpine bog EVC is now one of the most comprehensively mapped vegetation types in Victoria.



Arn Tolsma in an alpine bog at Mt Baw Baw in 2011, being photographed for an article on his work in *The Age* (photo James Shannon)

But Arn didn't do just alpine work. He developed techniques that are being used across the state to assess forest sustainability, small reserve condition and Orange-bellied Parrot habitat. His survey work ranged from threatened plant species to koalas, and he undertook research in a variety of vegetation types, from dry Box-Ironbark Forest to wet rainforest. If it needed doing, Arn did it.

And what would he consider to be the most gratifying aspect of his time at ARI? Simple. Being able in some small way to make a difference. Leaving our environment in better condition. You can't hope for more than that.

[National Geographic – Bogs are beautiful](#)

## ARI 50th Commemorative Book

At 3pm on the 8th April 1970, Queen Elizabeth II officially opened the Arthur Rylah Institute for Environmental Research. In 2020 ARI turned 50 and celebrated its outstanding legacy of delivering environmental science that matters and the many dedicated and skilled people that made it possible over the decades. Official celebrations were temporarily delayed due to COVID-19.

On the 19th of August 2022, ARI proudly launched a commemorative book to mark the 50 year milestone and to remember and celebrate the people, the place and its achievements: [People. Passion. Science. Celebrating 50 years of the Arthur Rylah Institute for Environmental Research 1970-2020.](#)

"ARI staff are greatly dedicated to their work, showing exceptional camaraderie, collaboration, and teamwork. They have had the resilience to survive over five decades and make a remarkable contribution to public science."

The book is a gift to the people of ARI, past and present, as an acknowledgement of their contribution to ARI and the high-quality environmental science that has made ARI the proud success it continues to be.





## News

### Understanding post-fire threats to potoroos, bandicoots and Lace Monitors

Victoria is home to a fascinating array of small to medium-sized mammals including the [Long-nosed Potoroo](#), [Long-footed Potoroo](#) and [Southern Brown Bandicoot](#), as well as the largest reptile in Australia, the Lace Monitor. These species are vulnerable to fragmentation caused by unnatural fire regimes and predation by introduced foxes and feral cats.

The 2019–20 bushfires had a major impact on the forests of eastern Victoria. The impacts on native species were twofold: first, through the direct mortality caused by the large-scale and intense fires; second, the loss of protective cover which increases vulnerability to predators.

The DEECA Southern Ark fox control program uses [camera traps](#) set across 240 sites throughout East Gippsland to keep track of native species. We analysed the camera-trap data collected in 2016–17, 2019 (both pre-bushfire) and 2020 (6-months post bushfire) to assess the response of Lace Monitor, Long-footed Potoroo, Long-nosed Bandicoot and Long-nosed Potoroo, to the 2019–20 bushfires and the presence of predators – Foxes and feral Cats.

In eastern Victoria, Lace Monitors, Long-nosed Bandicoot and Long-nosed Potoroo declined slightly after the fires, while overall Long-footed Potoroo occupancy remained steady post-fire. However, occupancy for the four native species was reduced where the fires were most severe. Lace Monitors had the most significant decline, followed by the Long-nosed Potoroo, Long-nosed Bandicoot and Long-footed Potoroo. Fox density was important in explaining the occurrence of Long-footed Potoroos, with a fox density higher than 0.5/km<sup>2</sup> meaning the probability of Long-footed Potoroos occurring at that site was zero. This highlights the importance of feral predator management after bushfires to support vulnerable species recover.



*Southern Brown Bandicoot*



*Long Nosed Bandicoot*

### Windstorm forest recovery in the Dandenong Ranges

ARI is [monitoring forest recovery in the Dandenong Ranges](#) after thousands of trees were blown down during the June 2021 windstorms.

Annette Muir is engaging with the Mt Dandenong community and Primary School to support learning about forest recovery after windstorms.

ARI is working with DEECA and Parks Victoria to assess the cumulative impacts of multiple disturbances from both fire and windstorms. This project will collect data to help untangle these effects.

There is a risk of poor regeneration of trees in these wind-affected areas due to a significantly reduced canopy cover. Preliminary results indicate a low number of weeds and a high presence of eucalyptus seed capsules in the affected area.

While this is a good sign, ongoing monitoring is needed to understand the regeneration rates and help guide management decisions to support forest recovery and fuel control in the Dandenong Ranges. This study aims to support land managers in responding to similar events in the future.



*Dandenong Ranges National Park, after June 2021 windstorm*

## Influencing Change

## Feature publications

**White, M.D., Hollings, T., Sinclair, S.J.,** Williams, K.J., Dickson, F., Brenton, P., Raisbeck-Brown, N., Warnick, A., Lyon, P., Mokany, K., **Liu, C.** & Pirzl, R. (2022). Towards a continent-wide ecological site condition database using calibrated subjective evaluations. *Ecological Applications*.  
<https://doi.org/10.1002/eap.2729>

**Kenny, S., & Moxham, C.** (2022). Does above-average rainfall stimulate a recruitment pulse in semi-arid woodlands of south-eastern Australia? *Journal of Vegetation Science* 33:e13148,  
<https://doi.org/10.1111/jvs.13148>

**Bryant, D. & Sinclair, S.** (2022). Small skink, expanding property portfolio: A range extension of Grey's Skink *Menetia greyii* in Victoria. *The Victorian Naturalist* 139.  
<https://www.thefreelibrary.com/Small+skink%2c+expanding+property+portfolio%3a+A+range+extension+of...-a0725120619>


**Newman, K.D., Nelson, J.L., Durkin, L.K., Cripps, J.K. & McCarthy, M.A.** (2022). An analytical solution for optimising detections when accounting for site establishment costs. *Ecological Modelling* 473, 10-117.  
<https://doi.org/10.1016/j.ecolmodel.2022.110117>

**Lumsden, L.F., Bush, B., Griffioen, P., Francis, L. & Moloney, P.** (2022). The response of insectivorous bats to environmental watering. Short-term response during inundation phase. *ARIER Technical Report No. 347*.

**Robley, A., Cally, J.G.,** Murray, A., Bluff, L., Collyer, A., Borg, N. and Phillips, L. (2022). The response of native species to the 2019–20 bushfires and introduced predators in far East Gippsland. Arthur Rylah Institute for Environmental Research Technical Report Series No. 329. Department of Environment, Land, Water and Planning, Heidelberg, Victoria.  
<https://www.ari.vic.gov.au/?a=563779>

## Knowledge transfer

ARI seminars (subscribe [here](#) on the ARI website):

 **"Animal behaviour: training and managing species for conservation"** Dr Eduardo Fernandez (University of Adelaide) and **"What's new at the zoo? Training detection dogs for conservation applications"** Nick Rutter (Zoos Victoria).

"The role of the public in pro-nature decision-making by government" (**van Eeden, L.M., Hames, F.,** Smith, L.D.G., Bekessy, A., Dovers, S., **Lowe, K.**)

ESA SCBO Presentation  
"Going wider and deeper: from the solo tip of an Antarctic iceberg, to the collaborative depths of transdisciplinarity." (**Hames, F.,** Haeffner, M., Barbour, M., Reeves, J., Grover, S., Platell, G.)

Glenelg Hopkins CMA  
"Moults, plumages and ageing of Sanderling." (**Rogers, D.**)

International Ornithological Conference 2022, Durban South Africa  
"Predicting and mitigating effects of sea-level rise on shorebird populations at the Western Treatment Plant, Australia"  
(**Rogers, D., Menkhorst, P.** Deistelhorst, E. and Steele, W.)

Mornington Peninsula Council  
"Understanding the leashing behaviours of dog owners in natural areas" (**van Eeden, L. M.**)

Geelong FNC  
Koalas in Victoria: A century of intensive wildlife management." (**Menkhorst, P.**)

DEECA BSK  
"Prioritising knowledge gaps for better research investment" (**Bruce, M.**)

Ringwood Field Naturalists Club  
"Bats: Fascinating Creatures of the Night"  
(**Lumsden, L.**)

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