

# ARI Terrestrial Quarterly Update

JUNE 2025



Winged Peppergrass (*Lepidium monoplacoides*).  
Photo by Claire Moxham

## About us

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

ARI's 90+ scientists have extensive expertise in fauna and flora research, ecological modelling and data analysis and interpretation across terrestrial, freshwater and marine environments. We work collaboratively with national, state and local agencies, universities and the community to deliver high quality and high-impact research and products to support better decision-making and improved reporting and evaluation.

## ARI scientists detect rare plant population bloom following floods

The Winged Peppergrass (*Lepidium monoplacoides*) is a nationally Endangered, cryptic, short-lived herb. Plants are difficult to detect, and little is known about the species, hindering recovery. For this reason, ARI scientists were excited when they detected a population boom at Hattah Lakes after the 2022-2023 floods. The local population more than doubled, and there was a geographical range expansion. The species is flood respondent, meaning it persists in the soil seed bank and germinates in response to increased soil moisture. Plants were found to be larger and had greater numbers of flowers and seed pods, compared to previous years.

[Annual monitoring of Winged Peppergrass](#) demographics, habitat, threats and management responses has helped us to develop both an accurate picture of population trends, as well as effective management actions for the species' recovery.

Management actions for the Hattah Lakes population involve browsing control, as well as limiting off track soil disturbance (e.g. vehicles) and implementation of appropriate flooding regimes.

Monitoring of the Winged Peppergrass has provided data that we now use to identify key knowledge gaps, determine threats, inform further management actions and to prioritise emergency recovery actions. Such management actions can be implemented and applied within government decision making tools; the [Strategic Management Prospects, SMP](#), recovery plan, Ramsar commitments and Biodiversity 2037 implementation.

For more information contact Claire Moxham, [claire.moxham@deeca.vic.gov.au](mailto:claire.moxham@deeca.vic.gov.au) or [sally.kenny@deeca.vic.gov.au](mailto:sally.kenny@deeca.vic.gov.au)

### Recovery of the Watson's Tree Frog

[Watson's Tree Frog \(\*Litoria watsoni\*\)](#) is a rare and cryptic forest-dependent species found in south-east NSW and east Gippsland in Victoria. Now nationally Endangered, this frog was not seen for 19 years in Victoria, until its rediscovery in 2015. Subsequent surveys have found this enigmatic species at just a handful of sites, almost all of which were burnt in the 2019-20 bushfires.

Population genetics work conducted by ARI since 2021 has revealed that the Victorian Watson's Tree Frog population has very low genetic diversity, elevated inbreeding and low effective population size. Without management interventions these declining populations are at high risk of extinction.

ARI is collaborating with DEECA Gippsland, Wild Research and Zoos Victoria to monitor and recover Watson's Tree Frog populations in Victoria. With support from a DEECA Icon Species grant, ARI is also working towards developing a Watson's Tree Frog-specific eDNA assay, which if successful could be used to test waterbodies for the presence of this species.

Since 2024, ARI has established a year-round acoustic monitoring program of known and potential breeding sites, to enhance our understanding of the breeding phenology of the species. Using an [Artificial Intelligence tool](#) trained to recognise Watson's Tree Frog's calls, we can now rapidly determine where and when this species has been calling, and target those locations for genetics



Watson's Tree Frog (*Litoria watsoni*).  
Photo by Louise Durkin

sampling. This allows us to find the frogs more efficiently, helps to build a picture of the genetic health of the Victorian population, and ultimately plan for genetic rescue management interventions.

For more information contact Louise Durkin  
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[In search of Watson's Tree Frog in a post-fire landscape - Louise Durkin, ARI \(SWIFT Seminar\)](#)

### Research digs into the future of our soils

ARI and Agriculture Victoria are undertaking two soil research projects [to unearth the secrets of healthy Victorian soil](#). Funded under the [National Soil Action Plan 2023-2028](#), the first project focuses on understanding and describing the diverse microbial communities within soils, in both agricultural and natural ecosystems. The second project aims to increase drought resilience by improving soil structure and function, enhancing water storage, reducing nutrient loss, and building soil carbon. Both projects are expected to be completed by June 2028.

This research will provide valuable insights into hidden soil biodiversity and how these organisms and other soil characteristics enhance productivity, resilience and recovery. Stakeholders will gain an improved understanding of the variation in soil structure and function across the entire State, leading to improvements to on-farm management practices and new approaches to selecting and investing in ecosystem restoration and recovery projects.

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[Premier of Victoria Media Release: Research investment digs into the future of soil health](#)



Soil biome samples.  
Photo by Matt Bruce



ARI's Dave Bryant taking soil samples.  
Photo by Bryan Mole



Soil biome sampling.  
Photo by Matt Bruce

### Wombat Forest: A shared vision for a healthy and thriving Forest

The Victorian Government has committed to create the Wombat-Lerderderg National Park. ARI has worked in partnership with government agencies and with three Registered Aboriginal Parties (RAPs) (Dja Dja Wurrung, Wadawurrung and Wurundjeri Woi Wurrung) to develop a [shared vision and approach for aspirational co-management arrangements](#).

This area supports significant natural and cultural values but has suffered many impacts since colonisation. Since European arrival, the forest has faced disturbances from gold mining, extensive logging, and more recently has been impacted by windstorms. During the gold mining era in particular, First Nations people were excluded from the forest, which halted many of their Traditional management practices. This transition to a national park offers a chance to transform the Wombat Forest and heal past harms.

Our scientists guided the process, by establishing a foundation of trust, developing a common understanding of the forest's context and values, and facilitating on-Country discussions and tangible case studies.

The process and report were intended to record the aspirations of management partners and to provide guidance for future joint management opportunities that respect the objectives and values of both Traditional Owner groups and government agencies. The report was not a plan for management nor a plan for governance.

The final vision encapsulates aspirations for the Wombat Forest where it is a healthy forest with vibrant and rich ecological and cultural communities.

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[The future of the Wombat Forest the aspirations of co-managers - Fact Sheet](#)

[ARI Technical Report No. 381 Partner aspirations for a healthy Wombat Forest: An exploration of manager values and objectives.](#)

## Influencing Change

### Feature publications

**Moxham, C., Duncan, M., & Kenny, S. A.** (2025). Winged peppergrass "Lepidium monophlooides" population and habitat observations at Hattah-Kulkyne National Park, Victoria. *The Victorian Naturalist* **142**, 4–12. <https://search.informit.org/doi/10.3316/informit.T2025031900008790956134635>

Parsa, M., **Ramsey, D.**, & Barnes, B. (2024). Optimal allocation of resources between control and surveillance for complex eradication scenarios. *Methods in Ecology and Evolution* **16**, 388–399. <https://doi.org/10.1111/2041-210X.14473>

Austin, L., **Amos, J. N.**, Robledo-Ruiz, D., Zhou, J., Clarke, R., Pavlova, A., & Sunnucks, P. (2023). Random mating in a hybrid zone between two putative climate-adapted bird lineages with predicted myonuclear incompatibilities. *Molecular Ecology* **34**, e17612. <https://doi.org/10.1111/mec.17612>

Wilson, B. A., Agosta, K., Garkaklis, M. J., **Cripps, J. K.**, Parrott, M. L., Cooke, R., & White, J. G. (2025). Identification and characteristics of refuges for the threatened swamp antechinus (*Antechinus minimus maritimus*) under climate change; targeted surveys across the Otway Ranges, south-east Australia. *Australian Mammalogy* **47**, AM24023. <https://doi.org/10.1071/AM24023>

**Cally, J. G., Macak, P. V.**, Chick, M. P., Blake, B., Wagner, B., & **Ramsey, D. S. L.** (2024). Mature forest habitat mitigates the decline of an endangered greater glider population through a widespread disturbance event. *Forest Ecology and Management* **578**, 122440. <https://doi.org/10.1016/j.foreco.2024.122440>

Eyre, A. C., Harley, D. K. P., Briscoe, N. J., **Lumsden, L. F.**, McComb, L. B. & **Lentini, P. E.** (2025) A possum's cautionary tale: targeted surveys in north-eastern Victoria fail to detect Leadbeater's possum in remnant forest within its historic range. *Australian Mammalogy* **47**, AM24030. <https://doi.org/10.1071/AM24030>

**Sinclair, S. J., Batpurev, K., Liu, C.**, Avirmed, O., Avirmed, B., Ricard, B., White, **M.D.**, Erdengerel, A., Miller, D. J. & Olson, K. (2025). Certifying the sustainability of herding practices in Mongolia. *Nature Sustainability* **8**, 245–255. <https://doi.org/10.1038/s41893-025-01511-1>

**Knowledge transfer:** Visit the [ARI Seminars webpage](#) to find upcoming and past presentations:

**Muir, A., Kohout, M. & White, M.** (2025) Measuring plant populations in Victoria - a manual for estimating threatened plant population size in the field. Arthur Rylah Institute for Environmental Research Technical Report Series No. 375. [https://www.ari.vic.gov.au/\\_data/assets/pdf\\_file/0017/732023/ARI-Technical-Report-375-Plant-Monitoring-Manual\\_V2.pdf](https://www.ari.vic.gov.au/_data/assets/pdf_file/0017/732023/ARI-Technical-Report-375-Plant-Monitoring-Manual_V2.pdf)

**Scroggie, M.P. & Moloney, P.D.** (2024) State-wide abundance of kangaroos in Victoria, 2024. Arthur Rylah Institute for Environmental Research Technical Report Series No. 385. [ARI-Technical-Report-385-State-wide-abundance-of-kangaroos-in-Victoria-2024.pdf](#)

**Moxham, C. & Kenny S.A.** (2025) Victorian Semi-arid Woodlands Monitoring program update October 2024: Defining Vegetation Condition, [Fact Sheet](#).

**Moxham, C. & Kenny S.A.** (2025) Victorian Semi-arid Woodlands Monitoring program update October 2024: Total Grazing Management Plan progress, [Fact Sheet](#).

**Moxham, C. & Kenny S.A.** (2025) Victorian Semi-arid Woodlands Monitoring program update October 2024: Broad vegetation condition change at monitoring sites, [Fact Sheet](#).

**Veltheim, I & White, M.** (2025) Brolga breeding habitat suitability model, [Fact Sheet](#).

Presentation at Southern Dandenongs Conservation Nursery. **Muir, A.** Hairpin Banksia conservation in the Dandenongs.

Presentation at World Congress of Herpetology. **Durkin, L.** Acoustic monitoring of floodplain frogs. 5th August 2024.

Presentation at World Congress of Herpetology. **Howard, K.** Monitoring the welfare of three floodplain turtles across large spatial and temporal time scales and evaluating the impact of human-induced environmental change. 5th August 2024.

Presentation at World Congress of Herpetology. **Howard, K.** Large-scale movement of a floodplain turtle and the impact of water management on habitat use. 5th August 2024.

Presentation at the Leadbeater's Possum Research Forum. **Durkin, L.** After the fire - unburnt refugia support post-fire occurrence of Leadbeater's Possum. 25th October 2024.

Presentation at the Leadbeater's Possum Research Forum. **Nelson, J.** Monitoring fuel break mitigations for Leadbeater's Possum. 25th October 2024.

Presentation at DEECA Grampians Region - Ballarat Office. **Farmilo, B.** Wombat Forest - establishing joint management through 'two-ways of knowing'. 17th February 2025.

Presentation at Latrobe University Research Symposium. **Durkin, L.** Fostering Research Collaboration in Environmental Science. Acoustic monitoring of floodplain frogs. 22nd November 2024.

We acknowledge Victorian Traditional Owners and their Elders past and present as the original custodians of Victoria's land and waters and commit to genuinely partnering with them and Victoria's Aboriginal community to progress their aspirations.



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