

ARI Aquatic Quarterly Update

SPRING 2025



Platypus
Photo credit: Doug Gimesy

About us

The Arthur Rylah Institute for Environmental Research aims to generate and share knowledge, through world-class, applied, ecological research. This research supports and guides sustainable ecosystem policy and management to ensure healthy, resilient ecosystems. We work collaboratively with national, state and local agencies, research institutes, universities, interest groups and the community.

Platy Patch: Funding to help Platypus thrive

The recovery of our iconic Platypus has received a massive boost, thanks to the landmark \$24M 'Platy Patch Project', a four-year, statewide initiative with significant co-funding from the Australian Government, Victorian Government and Melbourne Water. Platypus are listed as vulnerable in Victoria under the *Flora and Fauna Guarantee Act 1988*, with evidence of decline and local extinctions across the species' range.

The program includes the rehabilitation and protection of 15 sites across 10 regional urban areas and peri-urban Melbourne. Restoration efforts are focussed on supporting Platypus and 16 nationally threatened species. On ground rehabilitation efforts include revegetation, weed control, stock exclusion, placement of instream woody habitat, and installation of

'smart' rainwater tanks to regulate stormwater input.

ARI is leading this comprehensive partnership, which brings the extensive knowledge and experience of those working on Platypus and native aquatic species management together. Platypus are hard to study, since they are secretive and mainly active at night, dusk and dawn. Whilst found across much of Victoria, they need reliable surface water and flows, stable banks to burrow, intact streamside vegetation, instream woody habitat and sufficient invertebrate food.

The project is jointly funded by the Australian Government's Natural Heritage Trust under the Urban Rivers and Catchments Program, the Victorian Government and Melbourne Water, with the support of

catchment management authorities, City of Ballarat, Coliban Water, One Tree Planted and Zoos Victoria, under the guidance of the ARI. The project is also partnering with the Australian Platypus Conservancy, Traditional Owners, Parks Victoria and local Landcare groups.

Check out the Victorian Government's [media release](#), and ARI's website ([Helping Platypus recover](#)) and an [ARI Seminar](#).



A Murray Cod's marvellous adventure

We've recorded the longest known swim of a Murray Cod! A 50 cm fish (1.7kg) was acoustically tagged in March 2022 in the Mullaroo Creek. Six months later it moved into the Murray River and swam about 760km upstream to the Niemur River in NSW, in less than two months. This big swim occurred during a major flood event when a number of major weirs were temporarily removed from the Murray River. The fish has since moved about another 100km back downstream into the mid Murray River.

This swim highlights the importance of:

- waterway connectivity and movement as a recovery pathway for fish, following events such as fish deaths after major floods.
- tagging and tracking fish to understand their population dynamics across landscapes and responses to rehabilitation actions such as environmental flows.
- bringing datasets between projects together to maximise their analysis and value.
- collaborations between agencies (i.e. ARI, Murray-Darling Basin Authority, Mallee Catchment Management Authority, Commonwealth Environmental Water Holder/ Department of Climate Change, Energy, the Environment and Water, NSW Department of Primary Industry, South Australian Research and Development Institute).

This story has received significant media interest.
See a story in the [Guardian](#).



Aquatic eDNA sample collection methods

eDNA in research and monitoring programs

Environmental DNA (eDNA) is a modern tool to detect animals and plants by collecting traces of their genetic material (DNA) from the environment (e.g. water, soil, or air). eDNA surveys are a relatively new and potentially cost-effective option for monitoring and research programs, particularly within aquatic environments. However, current knowledge gaps and uncertainties regarding eDNA's application need to be understood when considering its potential use in projects. Consistent techniques and protocols for eDNA sampling need to be rigorously implemented.

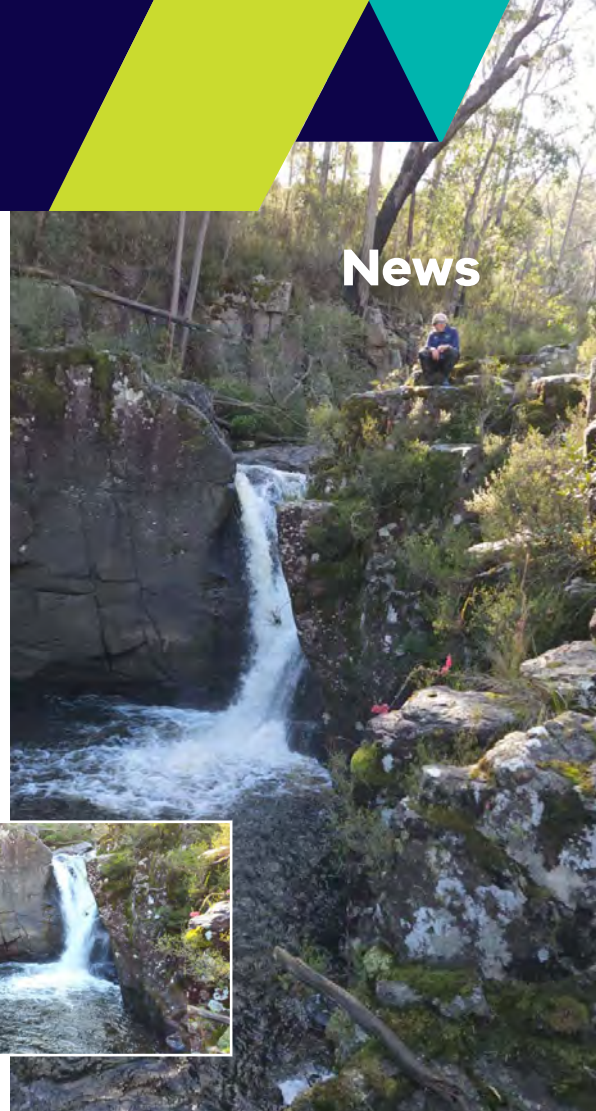
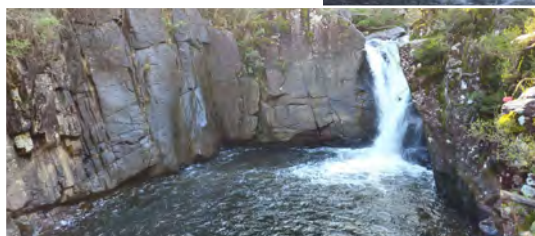
ARI offers expert guidance in how eDNA surveys can be used in research and monitoring programs and has capacity to process samples and analyse data. Contact Henry.Wootton@deeca.vic.gov.au and see [eDNA webpage](#) for further information.

High-resolution digital elevation models help threatened galaxiids

Five nationally threatened species of galaxiids have highly restricted distributions in Gippsland and are vulnerable to trout predation. ARI has been searching for suitable sites to translocate these fish and reduce their risk of extinction. Suitable sites are those free of trout, due to the existence of natural barriers such as waterfalls.

ARI has mapped, surveyed and found appropriate sites by using a 1m resolution digital elevation model (DEM). This highly accurate model provides a powerful three-dimensional graphic of the earth's surface and can clearly identify waterfalls. This has been a game changer, allowing ideal sites to be identified efficiently, saving time and effort in the field.

This work is funded under the Australian Government's [Saving Native Species program](#). It links closely with the [10inTen program](#) which is breeding and releasing threatened fish, crayfish and mussels. ARI has extensive expertise in [protecting our threatened galaxiids](#).

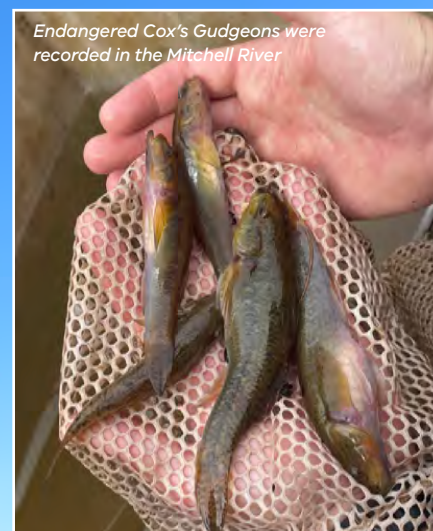


Native Fish Report Cards

The 2025 Native Fish Report Cards (NFRC) are available, summarising the results of annual fish surveys of 10 priority rivers. They provide insights on the status of fish populations and inform future management actions. Focusing on target species of high conservation or recreational value, they note whether:

- there has been recent recruitment
- multiple size classes are present
- mature fish are present in the population.

Brief information about the fish community within each river is also provided. This program is funded by DEECA Water and Catchments, the Victorian Fisheries Authority and Melbourne Water.



Endangered Cox's Gudgeons were recorded in the Mitchell River

Influencing Change

Our involvement in The Living Murray Program

[The Living Murray Program](#) (TLM) is a long running river restoration program which began in 2002. Monitoring occurs at Icon Sites, including:

- **Condition monitoring** – occurs annually and reports on progress against objectives and targets in Environmental Water Management Plans, and
- **Intervention monitoring** – conducts research and evaluation to assess responses to ecological interventions, monitors risks or statutory obligations.

Themes monitored include vegetation, fish, crayfish, turtles, waterbirds and woodland birds.

TLM is a joint initiative funded by the New South Wales (NSW), Victorian, South Australian, Australian Capital Territory and Australian governments, coordinated by the Murray–Darling Basin Authority.

ARI is taking a lead role in bringing TLM data together to enhance opportunities for rigorous analysis, including:

Creating a TLM database

ARI is developing a database to house all monitoring data and identify priority actions regarding data collection, management, analysis, evaluation and reporting. This project aims to maximise the value of this important long-term data set. This work is funded by the Murray–Darling Basin Authority, DEECA, Goulburn–Broken, North Central and Mallee catchment management authorities.



Common Yabby juveniles



A Pied Stilt at Lake Bitterang

Analysing the large TLM dataset

A wealth of data has been gathered in the last 20 years under TLM. ARI is undertaking a meta-analysis of this dataset to provide insights over a landscape scale, focusing on key ecological indicators (i.e. vegetation abundance and diversity and fish and bird populations) and explore options to align data where methods differ among sites. The condition and trends of these indicators will be documented, and the effectiveness of environmental watering and restoration activities to improve the health and resilience of floodplain ecosystems will be assessed.

This work will identify factors that contribute to ecosystem recovery and resilience, and challenges to achieving desired ecological outcomes. ARI will make recommendations to improve the effectiveness of TLM interventions and scaling of these interventions to similar restoration programs. This work is funded by DEECA Water and Catchments.

Carrying out a vegetation survey
at Greens Swamp Gunbower

Our involvement in The Living Murray Program (CONTINUED)

Monitoring and research within Icon Sites

The Applied Aquatic Ecology (AAE) team has been involved in monitoring and research to fill important knowledge gaps and evaluate intervention outcomes specific to Icon Site needs, including:

- **Hattah Lakes and Lindsay-Mulcra-Wallpolla** Icon Sites – starting condition monitoring for vegetation, fish and birds; updating Condition Monitoring Plans; and undertaking intervention monitoring to study native fish movement, in particular Murray Cod across the Lindsay and Mulcra Island anabranch network.
- **Barmah-Millewa** Icon Site – condition monitoring of fish and crayfish; an assessment of the distribution and abundance of Swamp and Common Yabbies; an investigation of flow regimes to improve fish recruitment; an evaluation of fish movement and residency patterns to inform management; and examination of the movement of Silver Perch and Golden Perch among different parts of the mid-Murray River network and environmental variables associated with movement.
- **Gunbower Forest and Koondrook-Perricoota Forest** Icon Sites – an analysis of existing datasets to better understand the relationships between vegetation condition and influencing factors, focusing on environmental water management.
 - **Gunbower** Icon Site – a soil moisture study to understand its relationship to floodplain vegetation; and monitoring Carp movements.

Across ARI, we have also been involved in monitoring turtles, frogs and vegetation in TLM Icon Sites. Many monitoring reports for Icon Sites are available here: [Living Murray Program](#).



Releasing a Silver Perch



Carrying out a vegetation survey in a wetland



Cows grazing in a wetland

Grazing benefits temporary freshwater wetlands in certain conditions

ARI has completed a long-term monitoring program which tested the suitability of [grazing guidelines](#) in Victoria's temporary freshwater wetlands (wetlands that experience cycles of wetting and drying). These natural wetlands, often found on private land, are productive for agriculture including livestock grazing. Twenty-one sites were surveyed annually between 2017 and 2024. At each site, there were paired plots (i.e. one grazed, one fenced to exclude livestock). Sites were exposed to varying periods of grazing (weeks to months).

This work found that under certain conditions, carefully managed grazing can benefit native vegetation when it:

- does not lead to the loss of grazing-sensitive native plant species
- prevents excessive leaf litter loads than can reduce plant species diversity
- prevents competitive introduced and native species displacing other species.

These findings corroborate the [Victoria's wetland grazing guidelines](#), which support landholders and natural resource managers to make wise grazing management decisions. See [Wetland Intervention Monitoring Program](#) for more information.

Publications

[Barrow et al.](#) (2025) Location of capture sufficiently characterises lifetime growth trajectories in a highly mobile fish. *Movement Ecology*.

[Harrisson et al.](#) (2025) Otolith and genomic data reveal temporal insights into stocking across a large river basin in a mobile, long-lived Australian freshwater fish species. *Molecular Ecology*.

[Higginson et al.](#) (2025) Integrating drone and deep learning technology to monitor floodplain changes in response to environmental flows. *Hydrobiologia*.

[Jones et al.](#) (2025) More than the sum of their parts – Environmental flows increase fish movement and fishway functionality. *Ecological Engineering*.

[Jones et al.](#) (2025) Managing river low flows to enhance instream vegetation recruitment. *Environmental Management*.

[Kopf et al.](#) (2025) Intraspecific body size determines isotopic trophic structure of a large river fish community. *Journal of Animal Ecology*.

[McNamara et al.](#) (2025) Livestock grazing and dense willow shading negatively impact instream plant growth. *River Research and Applications*.

[O'Connor et al.](#) (2025) Remediating a fishway entrance to improve fish attraction: a framework for success. *Journal of Ecohydraulics*.

[Wijepala et al.](#) (2025) Effects of seasonal inundation on riparian plant growth and reproduction. *River Research and Applications*.

Knowledge transfer

Radio and Podcasts:

[How we really feel about eels](#) (Koster) (What the Duck?! ABC Radio National); [Yalmy Galaxias conservation](#) (Lyon) (ABC Gippsland radio); Macquarie Perch Kangaroo River taxonomy (Raadik) (Sydney Morning Herald interview).

Presentations:

ARI Seminars: [Victoria's first conservation hatchery for freshwater native species](#) (Fawke, VFA) and [Captive breeding of the critically endangered Glenelg Freshwater Mussel](#) (Fernando, ARI); [Navigating barriers – fish movement in rivers](#) (Tonkin and O'Connor); Working with Traditional Owners on country to monitor the environmental values of the Finke River in Central Australia (Fernando) (VicBioCon25); Riparian vegetation State and Transition Model (Jones); WetMAP waterbird tracking: Sharp-tailed Sandpipers (Khwaja) (Environmental Water Reserve Officers meeting); Murray Crayfish: biology, ecology, and cultural collaboration (Raymond) (Murray-Darling Basin Authority/Goulburn Broken Catchment Management Authority workshop); Options for the management of Lungfish (Todd and Wootton) (Seqwater).

Work that ARI has been involved in has also been shared by our collaborators and via news channels: **Native Fish**

Report Card surveys: [Gellibrand River](#), [Wimmera River](#), [Mitchell River](#) (VFA); [Gellibrand River](#) (CCMA), [Lindsay Island](#) (MCMA), [Ovens River](#) (NECMA), [Mitchell River](#) (EGCMA); [Translocation of Macquarie Perch](#) (GBCMA); **Conservation Hatchery:** [Collecting Yalmy Galaxiids](#) (DEECA), [Hatchery first gives hope to endangered galaxias](#), [Walk through of hatchery](#), [Collecting Yalmy Galaxiids](#), [Release of Moroka and McDowall's Galaxiids](#), [Releasing McDowall's Galaxias](#), [Release of Blackfish](#), [Breeding Southern Purple Spotted Gudgeon](#) (VFA), [Glenelg Freshwater Mussel](#) (GHCMA), [Salvage of Flathead Galaxias](#) (GBCMA); Platypus Patch: [WIN News](#) (DEECA and GBCMA speakers) [\\$1.6m of Platypus Patch projects begin locally](#), [Platypus playground and habitat pieces placed in the Merri](#) (GHCMA)

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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