

Compiled by Pam Clunie

Wannon Falls

A Conservation Hatchery

Some of Victoria's most threatened native aquatic species will be part of a captive breeding program at a new conservation facility being built at the Snobs Creek Hatchery. These new facilities will allow scientists, Traditional Owners and industry to work together to select species, plan breeding and release programs, improve population genetic diversity and undertake community education.

Captive breeding of our threatened freshwater species is an essential part of future conservation efforts to prevent extinction. It will help species' recovery from extreme events (such as bushfires, droughts and floods) and also complement broader river and wetland rehabilitation efforts.

The first species of focus will be:

- a suite of small galaxiid species from the Gippsland area and Macquarie Perch which were badly affected by the 2019/20 bushfires
- Purple-spotted Gudgeon (a wetland species found in areas where rehabilitation actions are underway including provision of water for the environment) and
- South Gippsland Spiny Crayfish (a species affected by storm damage which would benefit from breeding trials to fill key knowledge gaps).

Many other species of threatened freshwater fish, crayfish and mussel may be the focus of captive breeding for conservation purposes in the future, depending on funding support, input from stakeholders and collaboration with agencies involved in broader rehabilitation actions.

The system and infrastructure design are underway, and construction is expected to begin in early 2023. Stay tuned for progress!



Cann Galaxias



Macquarie Perch juvenile



South Gippsland Spiny Cray



Purple-spotted Gudgeon

This initiative has been funded by contributions from Victorian and Commonwealth government, including the Victorian Fisheries Authority and the Victorian Environmental Water Holder.

See a recent [media release](#).

About us

The Applied Aquatic Ecology section aims to generate and share knowledge, through world-class, applied, ecological research. This 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.

News

Instream vegetation establishment trials to benefit Macquarie Perch

A small trial to establish River Club Rush (*Schoenoplectus tabernaemontani*) is underway in Hughes Creek. Historical vegetation clearance led to substantial sand inputs into the creek, which continue to be an issue. Mobile sand slugs blanket instream substrate, fill in pools and smother logs and boulders. The infilling of pools and rocky riffles, that are essential habitat components for the nationally threatened Macquarie Perch, has contributed to this species' decline in the creek. Instream revegetation and terrestrial plantings to stabilise the bed and banks in the creek is a priority within the Flagship Waterways program.

River Club Rush, often used in constructed stormwater treatment wetlands, was propagated and grown in a nursery in 2021. Mature plants, of local provenance, were installed on site in early 2022, using various installation methods and novel planting designs. This trial is assessing plant survival and establishment, and the suitability of the species and various planting designs.

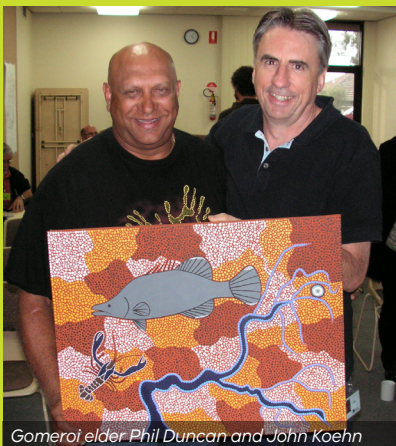
Monitoring results in June 2022 are promising, with all plants present and alive, and rhizomes developing into the substrate. This monitoring will continue over the next year. Whilst the value of this small, practical trial is already apparent, longer-term monitoring, larger scale plantings is recommended. A subsequent phase will trial more species, installation methods, growing formats and planting designs. DELWP Water and Catchments and the Goulburn-Broken CMA are funding the work.



River Club Rush

Dr John Koehn retires

After an incredible 42 years in Victorian government (primarily at ARI) Dr John Koehn has retired. A nationally recognised freshwater fish expert, John is an Honorary Fellow at the University of Melbourne, Adjunct Professor at Charles Sturt University and was inducted into the Australian Society for Fish Biology's [Fall of Fame](#) in 2021. Taking up an Honorary Fellow role at ARI, John will maintain his connections and collaborations with colleagues.



Gomerol elder Phil Duncan and John Koehn

Native Fish Report Cards

This year's [Native Fish Report Cards](#) are available, summarising the results of annual fish surveys of 10 priority rivers to provide insights on the status of fish populations and inform management. They focus on target species (i.e. those with high conservation and/or recreational value), noting whether there's been recent recruitment, and if multiple size classes and mature fish are present in the population. Brief information about the fish community within each river is also provided.

Notable findings this year include:

- an increased distribution of Trout Cod in the lower Goulburn River
- young Golden Perch recruits in the Murrumbidgee Creek
- the nationally threatened Australian Grayling recorded in the Yarra River again
- the Victorian threatened Cox's Gudgeon recorded in the Mitchell River again

It's the sixth year of these surveys, which are funded by DELWP Water and Catchments and the Victorian Fisheries Authority. This invaluable data contributes to other monitoring programs and supports regional communication and engagement.



Australian Grayling



Trout Cod

Influencing Change

Assessing the benefits of environmental water in rivers and wetlands

DELWP funds two long-term programs to monitor the benefits of environmental water within rivers and wetlands: The Victorian Environmental Flows Monitoring and Assessment Program (VEFMAP) and the Wetland Monitoring and Assessment Program for environmental water (WetMAP).

A suite of projects is currently underway to address priority knowledge gaps and research needs relating to environmental flows to support waterway managers. They vary in their commencement date, their size, timeframe and their regional scale.

The **VEFMAP fish theme** continues the [long-term annual fish condition monitoring](#) to assess population status and trends. In addition, there are five other projects which involve:

- [development of population models for key species to assess flow management outcomes and opportunities for refinement](#)
- [identification of key flow and habitat needs of early life stages of fish and decapods and how flows can be managed to benefit such species](#)
- [investigation of the effect of flows on downstream migration of eels](#)
- assessment of the links between flows and recruitment of River Blackfish and
- a desktop review of low flow recommendations for fish within Seasonal Watering Plans and related documents.

The **VEFMAP vegetation theme** includes four projects which involve:

- quantification of the effects of flows (and non-flow factors) on waterway vegetation
- investigation of how non-flow factors affect riparian vegetation responses to environmental flows
- evaluation of the impact of environmental flows on reproduction and recruitment of riparian vegetation and
- [evaluation of the importance of summer/autumn low flows for aquatic vegetation recruitment.](#)

The **WetMAP bird theme** includes three projects which involve:

- [investigation of how waterbird numbers vary across seasons and how this may affect responses to environmental water](#)
- investigation of the habitat requirements of waterbirds and the water regimes required to support this habitat, and
- investigation of the extent to which remotely tracked waterbirds use wetlands that have received environmental water compared to non-watered wetlands, including the mapping of specific breeding locations and habitat characteristics, as well as landscape scale movements.

The **WetMAP vegetation theme** includes one project focused on updating knowledge on the ecology, distribution and physiology of Tall Marsh, including the evaluation of the success of past Tall Marsh management. The output from this project will inform future management of this species.

The **WetMAP fish theme** currently has one project on Murray Hardyhead which includes ongoing monitoring as well as an analysis and evaluation of existing spawning and recruitment data.

In addition, monitoring the condition of vegetation and bird communities is occurring at a range of wetlands, building on data previously collected to contribute to our understanding of the benefits of environmental water.



Inspecting vegetation during a VEFMAP survey

Outputs

- Hale et al. (2022). [A synthesis of 15 years of instream woody habitat management: Progress towards benchmarks and assessing fish responses - Hale - 2022 - Freshwater Biology - Wiley Online Library](#)
- Jones et al. (2022). What state of the world are we in? Targeted monitoring to detect transitions in vegetation restoration projects. <https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1002/eap.2728>
- Koehn, Stuart and Todd. (2022). [Integrating conventional risk management and population models to assess risks from an established invasive freshwater fish.](#) Journal of Environmental Management
- O'Connor et al. (2022). [Developing performance standards in fish passage: Integrating ecology, engineering and socio-economics - ScienceDirect.](#) Ecological Engineering
- Raymond et al. (2022). [Larval fish sensitivity to a simulated cold-water pulse varies between species and age | Journal of Limnology \(jlimnol.it\)](#)
- Fogarty et al. (2022). [Multiple-region, N-mixture community model to assess associations of riparian area, fragmentation, and species richness - Fogarty - Ecological Applications - Wiley Online Library](#)



Instream woody habitat



Murray Cod larvae



Melbourne Water, ARI and Greenworks staff at Darebin Creek



Southern Pygmy Perch ready for release



A woodland with vegetation in relatively good condition



Celebrating 50 years of the Arthur Rylah Institute for Environmental Research

To mark our 50th birthday in 2020, we created a [commemorative book](#) to remember and celebrate the people, the place and our achievements.

PEOPLE PASSION SCIENCE.

Knowledge transfer

Presentations and meetings: Incorporating genetic management into threatened species recovery: a case study of Macquarie perch in the Ovens River (Tonkin) ([ARI Seminar](#)); Monitoring the ecological outcomes of environmental water ([SWIFFT seminar](#)) (Tonkin); Freshwater eel research by ARI reveals marathon journey to the Coral Sea ([ABC Ballarat](#)); Eel research and monitoring (Birraring's Billabongs: On Country Day), (Geelong Field Naturalists Club) (Koster), Wheelers Hill Primary School - for Melbourne Water (Clunie); Burrowing crayfish in Gippsland (Crowther) (ABC Gippsland radio); Ghost fish apparition in the Shire (Raadik) (Yea Chronicle); Media releases – Lily D'Ambrosio; [Protecting our precious platypus](#).

Work that ARI has been involved in has also been shared by our collaborators: Platypus in the Tambo River – [home renovations](#) and [revegetation](#) (EGCMA); National Science Week – [fish monitoring](#), [fish rescue](#) – [Barmah-Millewa Forest](#); [Southern Pygmy Perch translocations](#); [Gaynor Swamp WetMAP monitoring](#) (GBCMA); [Glenelg Freshwater Mussel survey](#), [VEFMAP fish survey – Glenelg River](#) (GHCMA); National Science Week – [eel surveys](#), [Darebin Creek fishway](#) (Melbourne Water); VMFRP [Golden Perch recruitment](#), [Bird surveys](#) (VMFRP)

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