



Fish Surveys

Statewide

Annual fish condition monitoring across priority Victorian waterways: Assessing trends in population demographics to inform water management

Aims

Monitor native fish communities to track progress towards sustaining or improving populations using flow management

The specific aims are to:

- Continue annual fish condition monitoring in six priority Victorian rivers which receive environmental water. The work will generate sufficient data to assess trends in fish population abundance, distribution, and recruitment, when subjected to variation in river conditions, including due to droughts, floods and environmental flow delivery that occur on decadal time scales.
- Describe long-term trends in relative abundance, distribution and recruitment for priority fish species spanning a range of life-history strategies and quantify links with environmental covariates (particularly key aspects of river flow). This work will track progress towards achieving the fundamental objective of flow management to sustain or improve native fish populations, help inform annual flow management and identify knowledge gaps.
- Meet Victoria's monitoring and reporting obligations under the Commonwealth Murray-Darling Basin Plan (MDBP), particularly for reporting on Schedule 12, Matter 8 (the achievement of environmental outcomes at an asset scale); and provide data to support legislative reporting needs for the Victorian Long Term Water Resource Assessment.
- Communicate outcomes to key stakeholder groups including waterway managers, Traditional Owners and recreational fishers.

Victorian Environmental Flows Monitoring and Assessment Program

Annual fish monitoring: priority species and priority river reaches

Background

A fundamental objective of environmental water, and waterway restoration programs more broadly, is to maintain or improve populations of native fish. As such, monitoring populations is critical for these programs.

Since 2007, the annual fish monitoring by VEFMAP in priority Victorian rivers has provided substantial insights into population trends and processes and their associations with environmental flows. Other important data obtained (such as genetic samples and otoliths) have helped assess connectivity and recruitment outcomes.

Fish population responses to environmental flows can be challenging to distinguish, given the interacting effects of many modifiers. This project contributes key data to better understand long-term population trends and link these trends to flows.

Research questions

1. What are the long-term (ideally > 10 years) trends in distribution, abundance, and recruitment of priority fish species at reach, waterway, and regional scales?
2. What is the role of flows in determining the within-reach distribution, abundance, and recruitment of priority fish species annually and over the long term (> 10 years)?
3. Are key objectives of the Basin Plan relating to fish populations (abundance, distribution) and processes (e.g. recruitment) being achieved for priority fish species in Victorian rivers?
4. Can knowledge of long-term (> 10 years) trends in fish distribution, abundance and recruitment be used to refine annual flow management?

Approach Annual electrofishing (boat, backpack, and/or bank-mounted) will occur at:

- 44 sites from three rivers systems in northern Victoria
 - Campaspe River (16 sites: reaches 2, 3 and 4)
 - lower Loddon system: Pyramid Creek, Loddon River (16 sites: reaches 4 and 5).
 - Broken River / Creek (12 sites)
- 40 sites from three river systems in southern Victoria.
 - Glenelg River (11 sites: reaches 1a, 1b, 2 and 3).
 - Thomson River, including Rainbow Creek (14 sites: reaches 2, 3, 4a, 4b and 5)
 - Moorabool River (15 sites: reaches 1, 2, 3a, 3b and 4)

Priority fish species have been selected which have one or a combination of high cultural, conservation, or recreational value, and incorporate a range of life history strategies.

- *Northern rivers:* Murray Cod, Trout Cod, Golden Perch, Silver Perch, Murray-Darling Rainbowfish

- *Southern rivers:* River Blackfish, Tupong, Estuary Perch, Australian Grayling and Common Galaxiid

Data collected from other monitoring programs e.g. The Living Murray, Flow-MER, and the Native Fish Report Card will be incorporated into analyses as appropriate.

Timeline January 2022 to June 2024

Outputs

- Brief **Field Survey Updates** will be distributed after each field trip.
- **Annual reports** for southern and northern Victorian river monitoring results will outline general trends in species composition, relative abundance, distribution and size structure of priority native fish species.
- **Final reports** for southern and northern Victorian river monitoring results will involve a more extensive analysis. This will include modelling to examine fish population trends and responses to flow conditions accounting for variation in non-flow factors such as temperature, stocking and exotic species interaction.

Outcomes

- Assessment of the progress of environmental flows supporting native fish populations at reach, waterway, regional and state-wide scales.
- Specific advice to inform seasonal and annual watering decisions.
- Contribution to the reporting of MDB Plan monitoring obligations.
- Promotion of the findings of this monitoring, including how flow management supports native fish populations with a range of target audiences, including in collaboration with regional waterway managers.

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