

How do we know if environmental watering is successful?

Scientific and community knowledge is key to understanding the success of environmental watering

To effectively manage environmental water and measure the success of environmental watering, it is important to draw on the large body of scientific and community knowledge that exists about Victoria's rivers and wetlands.

Scientific and community knowledge is used to support key aspects of environmental water management such as understanding what environmental values exist in different regions, how these values can be supported with environmental water, and whether environmental watering is achieving its objectives.

What is monitoring and how is it done?

The monitoring of environmental watering is generally the observation, recording and evaluation of one or more environmental flows and associated outcomes over a period of time using different tools and methods.

Examples of tools used to monitor environmental flows include water gauges to observe volumes of water travelling past a certain point, electrical conductivity meters to measure salinity (dissolved salt) levels in the water, drift nets to pick up fish eggs floating in the water, and vegetation quadrants to measure how much of a particular native plant is emerging near a river or wetland.



Golden perch eggs in a drift net, by Wayne Koster

Why is it important to monitor environmental watering?

Environmental watering is an evolving field that aims to improve the health of modified river and wetland systems and protect the environmental values that remain. As we are always learning about the needs of complex river and wetland systems and the native plants and animals they support, it is important to monitor environmental watering and ask, 'Is environmental watering achieving results? Has environmental watering been successful? How can it improve?'

Monitoring is critical to:

- ▶ ensure **accountability** by enabling environmental water managers to report on the use of environmental water
- ▶ ensure **transparency** by investigating (and communicating) the ecological benefits of environmental watering
- ▶ improve **efficiency** by facilitating learning and improved management.



Drouin West gauging station, by Sarah Gaskill

Types of monitoring and what they measure

In Victoria, monitoring is undertaken over different geographic scales and time frames as Figure 1 shows.

The information gained from each type of monitoring is shared between organisations and communities to build a comprehensive picture of the ecological benefits of environmental watering.

Monitoring in Victoria is funded by both the Victorian and Commonwealth governments and generally carried out by waterway managers and community members.

Monitoring stream condition in the Glenelg River

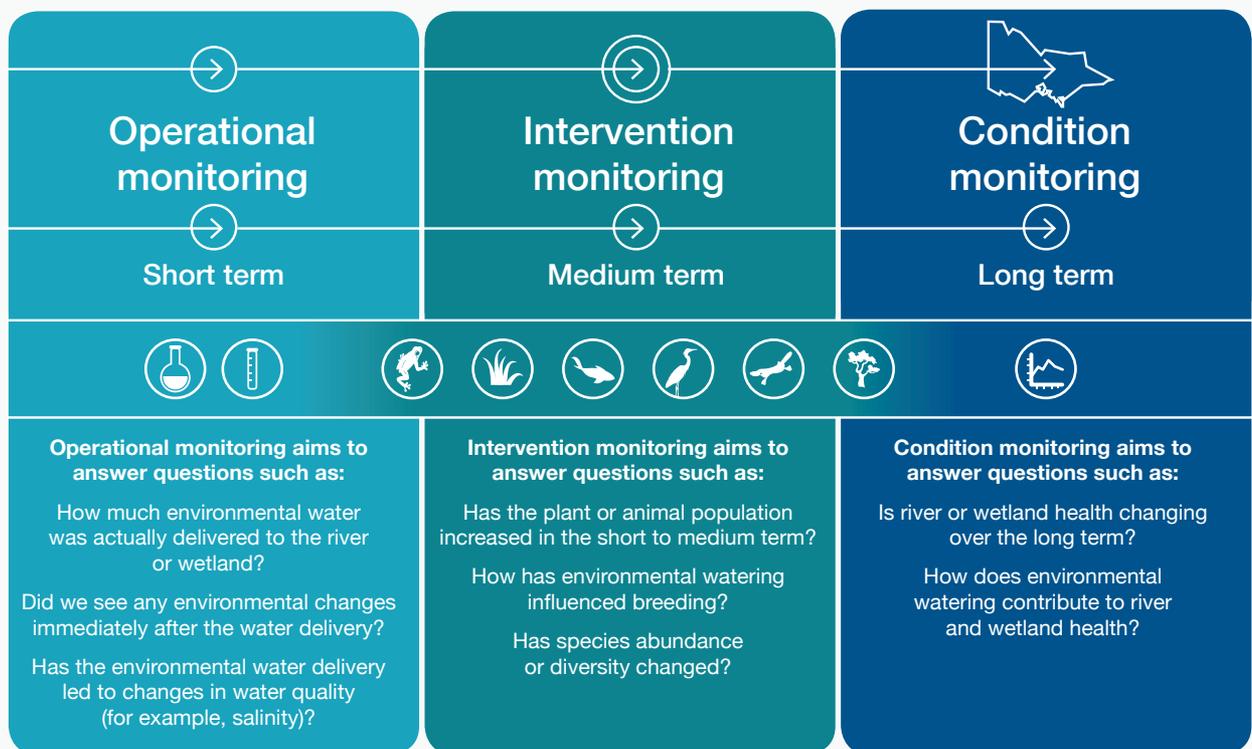
The Department of Environment, Land, Water and Planning (DELWP) funds river condition monitoring in the Glenelg River.

Over 20 sites have been monitored over a period of six years, focusing on salinity levels, changes in fish populations and vegetation recruitment.

This form of **condition monitoring** informs environmental water management decisions by indicating long-term changes in river condition. These long-term changes are caused by an array of factors and river health measures including environmental watering.

An example of a trend discovered through this monitoring is the increase in native fish abundance and distribution in the Glenelg River since 2009.

Figure 1. Types of monitoring and what they measure



Platypus on the Tarago River, by Keith Chalmers

Monitoring platypus movement in the Tarago River

Melbourne Water, like other waterway managers, has been undertaking platypus monitoring programs for many years.

This involves briefly capturing platypuses and taking various measurements. The platypuses are then microchipped, just like pet cats and dogs, so their future movements in the river can be tracked. In the Tarago River, Melbourne Water has also acoustically tracked platypus movement.

This sophisticated form of **intervention monitoring** informs environmental water management decisions by providing information about the timing of flows and types of flows needed to ensure sustainable populations of platypuses in rivers like the Tarago.

If you see a platypus, please log your sighting at www.platypusspot.org

The benefits of environmental watering

Many positive outcomes have been observed from environmental watering in Victoria. Some examples are illustrated in Figure 2 below.

Monitoring salinity and oxygen levels in the Wimmera River

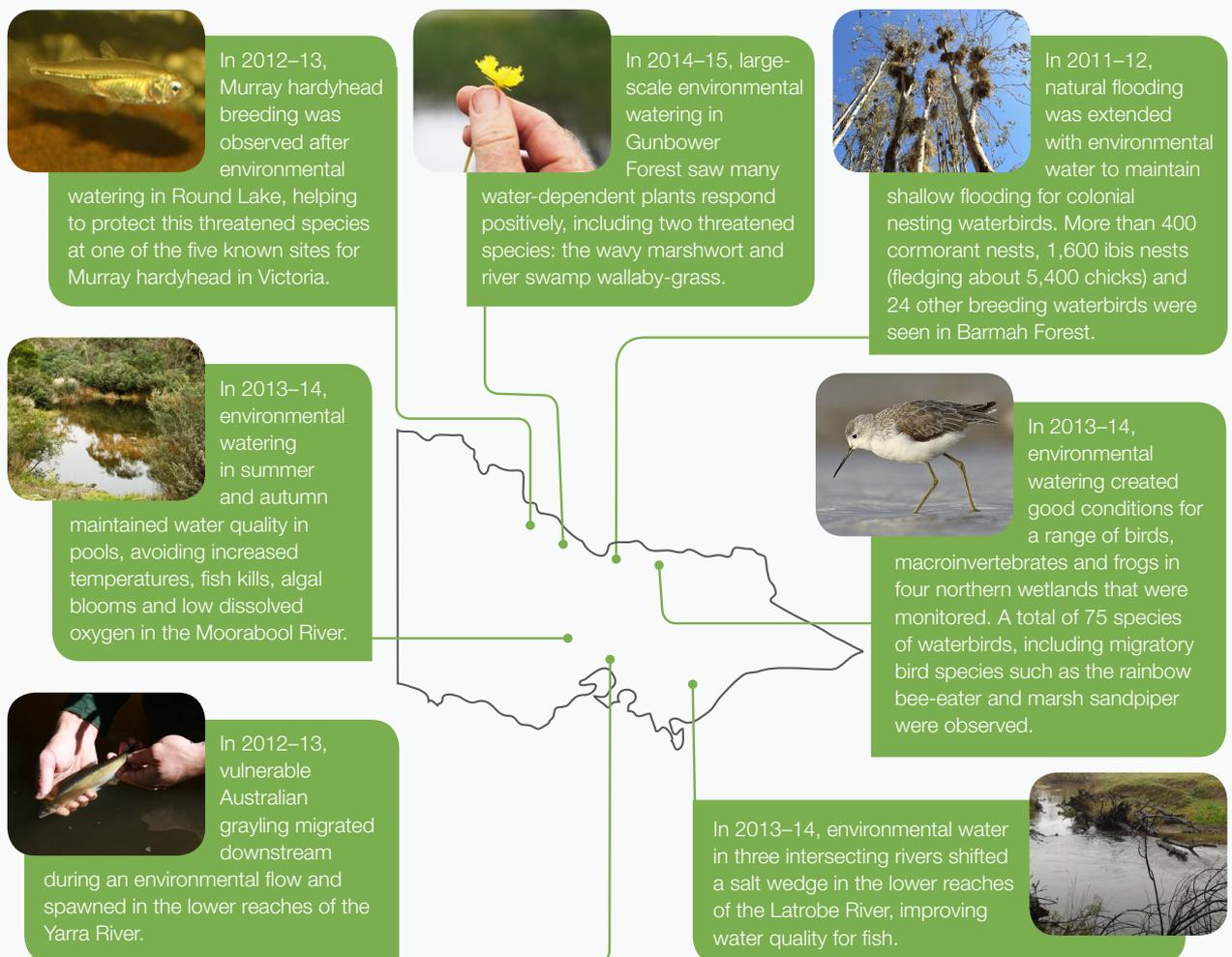
The Wimmera Catchment Management Authority monitors salt and oxygen levels in the Wimmera River using water quality meters.

This form of **operational monitoring** informs environmental water management decisions about when, where and how much water is needed to maintain water quality in the river for fish, bugs and vegetation.

Environmental water is used as effectively as possible to reduce the impacts of poor water quality.



Figure 2. Examples of environmental watering achievements in Victoria



Monitoring Australian grayling breeding and migration in the Thomson and Yarra rivers

DELWP and Melbourne Water fund monitoring of the migration and breeding behaviour of the Australian grayling, a vulnerable native fish species, in the Thomson and Yarra rivers. The monitoring is conducted as part of the Victorian Environmental Flows Monitoring and Assessment Program and looks at grayling responses to environmental flows (specifically autumn freshes).

To monitor how adult Australian grayling migrate, acoustic tracking devices are used to record their movement. Breeding is then measured using drift nets to capture any Australian grayling eggs and larvae before, during and after the fresh.

So far, this form of **intervention monitoring** has provided evidence that Australian grayling are highly dependent on autumn freshes—which increase the volume of flow—to trigger downstream migration and breeding.

Environmental watering decisions are based on the best-available science

The science underpinning environmental water management will continue to evolve with more monitoring, research and management experience.

While the body of knowledge about environmental watering has grown in recent years, further monitoring will build on this and enable environmental water managers to improve management and ensure that environmental water is being used sensibly and efficiently. New knowledge and experience is considered each year so that environmental watering decisions are always based on the best-available science.



Thomson River, by West Gippsland Catchment Management Authority

VEWH and Goulburn Broken CMA staff sampling bugs at Moodies Swamp, by Chloe Wiesenfeld



Royal Spoonbill at Dowd Morass, by West Gippsland Catchment Management Authority