Waterway health

The Water Act 1989 requires a long-term water resource assessment every 15 years to assess whether water availability has declined or if waterway health has deteriorated for reasons related to changes in flow.

What is waterway health?

Waterway health is a general term for the overall condition of key features and processes that underpin functioning waterway ecosystems. It is made of a diverse mix of elements including:

- presence, abundance and diversity of species (plants and wildlife)
- extent and connectivity of habitat
- breeding and feeding opportunities for fish, frogs, birds and other wildlife
- carbon and nutrient cycling processes
- water quality.

Assessing waterway health as either ‘good’ or ‘poor’ is extremely complex because of the many different interacting ecosystem components. For example, even if water quality is good, there may still be low numbers of an important fish or plant species, due to an invasive species like European carp dominating the waterway.

In order to determine whether waterway health has deteriorated, it’s necessary to have long-term datasets that indicate a trend (either upwards or downwards). After assessing an array of datasets during the technical assessment, three types of data were identified that had been collected consistently over a long enough period to possibly show a trend: water quality, macroinvertebrates and fish.

Assessing waterway health

The long-term water resource assessment is the first statewide effort to quantitatively assess changes in waterway health for flow-related reasons over a long, retrospective period.

The assessment involved:

- identifying indicators of waterway health that had adequate long-term data
- trend analysis to determine if each indicator was increasing or decreasing
- causal analysis to see how much of any trend detected could be attributed to changes in components of the flow regime.

These analyses were used to determine whether the waterway health indicators for each basin are improving or deteriorating, or if no change was detectable. They were also used to determine the extent to which changes in indicators were related to flow.

Changes in flow patterns have knock-on effects for the health of ecosystems. Too much water, too little water, or either of these at the wrong time of year may limit or stop natural processes. For example, for some fish species, breeding is triggered by pulses of fresh water of a certain temperature.

Figure 1. Glenelg River at Yat Nat Hole (photo by Chloe Weisenfeld)

Waterway health and flow

A long-term water resource assessment examines waterway health specifically as it relates to flow — the amount (volume) of flow, the duration of specific flow events and the time of year a flow event occurs.

Aquatic ecosystems have evolved to rely on well-established flow patterns. For example, certain flow components are needed at certain times of year for plants and wildlife to successfully grow, feed, reproduce and move through the landscape.
What the long-term water resource assessment found

The technical assessment found deterioration in some indicators of waterway health in some basins that was due to changes in the flow regime (e.g. salinity). However, in many of these same basins there was an improvement in other indicators of waterway health also related to changes in flow (e.g. dissolved oxygen).

In most basins, there was not enough data (i.e. more than 20 years) to show conclusive trends in the aspects of waterway health most valued by stakeholders (e.g. aquatic animal and plant life). The assessment provides specific results in each basin for each indicator for which there was enough data.

The assessment didn’t conclusively determine an overall deterioration or improvement in waterway health for reasons related to flow, for two primary reasons.

First, to measure long-term trends this assessment required datasets dating back more than 20 years, but waterway health monitoring programs from decades ago were not designed to meet the needs of the long-term water resource assessment because the assessment did not yet exist. Consequently, only a limited number of indicators measuring specific aspects of waterway health have been monitored across the state for the long-term period needed.

Second, as described previously, waterway health is a general term for the overall condition of waterway ecosystems. It is made up of many components, which are influenced by flow in different ways, such that some indicators may be improving while others are deteriorating in the same waterway over the same period. Assessing an overall change in condition amid the complexity is difficult.

Next steps

The process of undertaking this first long-term water resource assessment has highlighted the need for more comprehensive waterway health data for future assessments.

The government is investing in monitoring waterway health in relation to flow (including through the Victorian Environmental Flows Monitoring and Assessment Program) to improve data collection for indicators of waterway health so that in future we will have better data to track long-term trends in appropriate indicators.

Join the conversation

We invite you to go online to engage.vic.gov.au/ltwra to provide us with your feedback on the draft technical assessment for southern Victoria. ‘Open House’ events are being held across southern Victoria in October 2019. Everyone is welcome to drop in to talk about the draft assessment, sustainable water strategies and other water-related projects.