

The Victorian Government is supporting community partnerships over the next four years through Waterwatch and other citizen science initiatives to address local waterway priorities.

These priorities are being addressed as part of the government's \$222 million investment over the next four years to improve catchment and waterway health across regional Victoria. This investment is a key component of Water for Victoria – the government's plan for management of our water resources now and into the future.

What's being done?

Birch's Creek is a priority waterway, continuing to support populations of platypus and river blackfish. The creek has a small environmental water allocation and is highly valued by the community for its natural values, recreation and as a source of stock, domestic and irrigation water.

Our project is working to protect and improve these values by working with landholders to fence the creek to manage stock access, remove weeds such as willow and blackberry and replace them with native vegetation where possible. This creates a buffer for the creek, reducing sediment and nutrient input, and restores a greater diversity of habitats to the creek and its banks.

The first species to take advantage of these changes are the smallest; the invertebrates. This makes them a great indicator of improvements to the health of the creek. Invertebrates are the base of the food chain too, so we can be confident when we see improvements in the invertebrate populations, this, in turn, will benefit the larger species such as fish, platypus and waterbirds.

Waterwatch monitoring will track the progress of the Birch's Creek recovery program and help assess the benefits of water for the environment.

Acknowledgement of Country

The North Central Catchment Management Authority (CMA) acknowledges Aboriginal Traditional Owners within the region, their rich culture and spiritual connection to Country. We also recognise and acknowledge the contribution and interest of Aboriginal people and organisations in land and natural resource management.

How to get involved



Contact your local **Waterwatch Coordinator** at the **North Central Catchment Management Authority**

✉ Via post: **PO Box 18, Huntly VIC 3551**

☎ Phone: **03 5448 7124**

📍 Main Office: **628–634 Midland Hwy
Huntly Victoria 3551**

✉ Email: **info@nccma.vic.gov.au**

Or follow us on:  

Heavy willow infestation along the creek before the start of works



Nearing completion of the willow removal, October 2017



North Central Waterwatch Birch's Creek River Health Snapshot Report 2017



North Central Waterwatch and the Birch's Creek Priority Waterways projects are working towards improving the ecological health of this waterway. Working with local citizen scientists to collect and report important information about these waterways will help us better understand the results of our projects.

Understanding and reporting on the condition of our waterways is important for guiding waterway management decisions and demonstrating management outcomes. North Central Waterwatch is helping North Central Catchment Management Authority (CMA) projects to work with the local community, or citizen scientists, to develop the knowledge and skills required to collect valuable information on the ecological condition of waterways across north central Victoria.

This report focuses on the Birch's Creek Priority Waterways project, and the aim is to understand what the effects of environmental works are having on the water quality of

Birch's Creek using citizen science data and creating an opportunity to share this information back to the community.

Woody weed control, including the removal of willows, has been an important focus for the project. The project has already undertaken willow removal along parts of Birch's Creek with nearby landholders. With strong community support for the works, establishing a citizen science monitoring program will help us to keep a watchful eye on the progress of this project.

The project aims to:

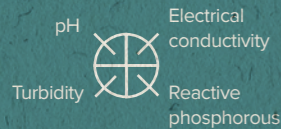
- Install riparian fencing
- Install off stream watering troughs
- Undertake woody weed control
- Undertake revegetation of native vegetation

During the project implementation, citizen scientists will continue to play an important role in monitoring the ecological health of waterways. Water quality and macroinvertebrate indicators, available through this project, are used to track changes in ecological condition over time.

Water Quality Colour Coding

Sites have been colour coded and interpreted as follows:

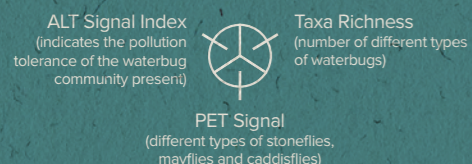
- Good:** Water quality is acceptable and has minimal impacts on aquatic ecosystem health.
- Moderate:** Water quality and aquatic ecosystem health are moderately impacted.
- Poor:** Water quality and aquatic ecosystem health are largely impacted.



Waterbugs Colour Coding

Sites have been colour coded and interpreted as follows:

- Meets or exceeds ALT objectives for a healthy ecosystem** (>30th percentile of index values for reference sites). Key processes and/or water quality may be slightly impacted however most habitats are intact.
- Close to meeting ALT objectives for a healthy ecosystem** (5th—30th percentile of index values for reference sites). Many key processes are not functional; water quality and/or habitat are moderately impacted.
- Does not meet ALT objectives for a healthy ecosystem** (<5th percentile of index values for reference sites). Most key processes are not functional and water quality and/or habitat is severely impacted.



Water quality indicator levels

Water quality indicator levels for the Cleared Hills bioregions:

SEPP (WoV) segment	River health category	Reactive Phosphorus (mg/L)	pH (lower)	pH (upper)	Electrical conductivity (µS/cm)	Turbidity (NTU)
Cleared Hills	Good	≤0.03	≥6.3	≤8.5	≤700	≤15
	Moderate	>0.03 ≤0.1	<6.3 ≥5.5	>8.5 ≤9.0	>700 ≤1500	>15 ≤25
	Poor	>0.1	<5	>9.0	>1500	>25

Interpreting results

The results in this report are based on the analysis of macroinvertebrate monitoring data collected in spring 2017. The report provides a baseline assessment of the current condition Birch's Creek using citizen science data.

The Victorian Government has a set of guidelines that provides limits to acceptable water quality levels and macroinvertebrate indices for healthy ecosystems. These levels are based on biological characteristics assigned to parts of the catchment which is determined by its position in the region.

In this program, the catchments lie within the Cleared Hills Bioregion.

Four water quality parameters were measured at each site during this time; pH, electrical conductivity, reactive phosphorus and turbidity. And three indices are calculated using macroinvertebrate data, assessed against Agreed Level Taxonomy (ALT) reference condition values.

Each site was assessed against these reference condition values and are calculated based on information known for the area, as if it was in the best available condition for that region

Clunes

Birchs Creek @ Daylesford Clunes Road

This site received similar treatment about 15 years before the current project. Willows and woody weeds were removed, stock access was controlled with fencing and the site was revegetated with indigenous species. It is now quite a mature restoration site. Results for water quality at this site indicate the site is generally in poor to good health. However, macroinvertebrate scores for all three index scores almost met the ALT objectives.

Why? This is one of our star sites from a willow removal revegetation point of view, but it has high salinity. The removal of the willows, fencing and revegetation has established a more natural and diverse range of habitats, which is great for the species diversity of the creek. Removing the monoculture of willows and woody weeds lets the sun back in and allows in-stream plants such as water ribbons, and fringing vegetation such as rushes and sedges, to return, creating important habitat for invertebrates and the food chain that depends on them.

The higher salinity concentration at this site is likely to be associated with groundwater inflow from the nearby basalt aquifer. Groundwater is an important contributor to the flow of Birch's Creek and is part of the reason the creek usually flows throughout the year. This groundwater brings some salt with it, which can concentrate through evaporation as it flows downstream. The quality of the water is still good compared to many other parts of our catchment, and the salinity level is not high enough to be a concern for many species.



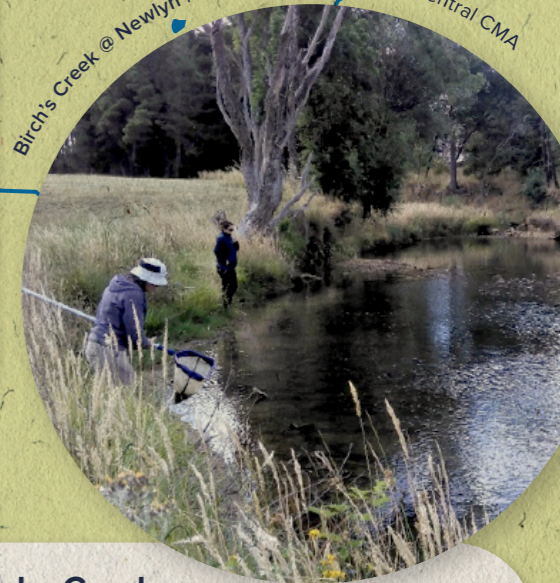
Birch's Creek @ Anderson's Mill

Birchs Creek @ Andersons Mill

This site was sampled before the removal of willows and other woody weeds. The waterways was heavily shaded by exclusively introduced vegetation, consisting largely of willows, elm suckers and blackberries. Results for water quality at this site indicate the site is generally in moderate to good health. Macroinvertebrate scores for taxa richness and ALT signal almost met the ALT objectives for ecological health, while the PET score fell just short of meeting the objectives, indicating a poor to moderately healthy ecosystem. The results for this site were not as good as those for the Verona-Kingston Road site where willows were removed six months earlier.

Why? Since the site was sampled, the willows and other woody weeds have been removed. This is expected to impact on future results, due to increased sunlight, temperature and potential sediment mobilisation as the willow roots break down. This may then be followed by a sustained improvement in the results over the coming years as a diversity of habitats return as fringing vegetation, and in-stream vegetation re-emerges after being shaded out by willows. Revegetation will also be re-established on the banks upstream. There are already signs of this downstream, where willows were removed months earlier, with in-stream vegetation returning and frequent observations of small-bodied fish.

Birch's Creek @ Newlyn looking upstream, North Central CMA



Kingston

Birchs Creek @ Werona-Kingston Road

Results for water quality at this site indicate the site is generally in moderate to good health; an excellent outcome given works to remove willows and other woody weeds from the site were completed only six months before sampling. Macroinvertebrate scores for the three index scores varied from poor (taxa richness) to good ecosystem health. These scores should continue to improve as revegetation on the site becomes established and fringing vegetation continues to recover after the willow removal, creating a greater diversity of habitats.

Why? Water quality and macroinvertebrates at this site may have been influenced by altered flow regimes, stock access, and silting of pools from both stock access and willows. The heavy willow infestation crowded out other vegetation and reduced habitat diversity. While taxa richness was poor at this site, a good result for ALT signal indicates the site has improved since the willows were removed. The site has also been fenced to manage stock access which, in turn, will reduce sediment and nutrient input to the creek and protect the aquatic ecosystem. Improving native vegetation and grass cover along the banks of waterways will protect water quality, with plants often acting as a physical filter, trapping sediments as water drains through, and stabilising banks, protecting against erosion.

Birch's Creek @ Werona-Kingston Road



Birchs Creek @ Newlyn Reservoir

This section of Birch's Creek is immediately downstream of the Newlyn Reservoir and generally in good condition. Goulburn Murray Water removed willows from the sample site in 2010, with further willow removal undertaken downstream in 2016 by North Central CMA and Central Highlands Water. Macroinvertebrate scores for taxa richness and ALT signal almost met the ALT objectives for ecological health, while the PET score fell just short of meeting the objective.

Why? Historically, this macroinvertebrate communities site may have been affected by poor water quality and degraded habitats. In 2016, significant removal of woody weeds such as hawthorn, blackberry and willows was undertaken. The area was revegetated with native vegetation including a variety of local eucalyptus and acacia species. It is likely that the response of macroinvertebrates indicates that the water quality has improved over time.

Newlyn North