



# A Healthy Coliban Catchment

Citizen Science Project

River Health Snapshot Report 2023



WaterWatch  
Victoria



*A Healthy*  
**Coliban**  
*Catchment*

North Central WaterWatch supports people to actively care for their environment by participating in Citizen Science programs that monitor and report on the health of the region's land, water, and biodiversity resources.

North Central CMA, Coliban Water, and Dja Dja Wurrung Traditional Owners continue to implement A Healthy Coliban Catchment, a 20-year plan to improve the health of the upper sections of the Coliban River and its tributaries. The aim of this project is to protect the Coliban River as a source of quality drinking water and by doing so, improve habitat connectivity, boost sustainable land use practices, and work with the community to further build cultural and recreational values.

In addition to providing drinking water for more than 130,000 people in towns such as Bendigo, Kyneton, and Castlemaine, the Upper Coliban catchment is a place of great historic, environmental, social, and economic value. The region also has a high cultural significance, with Traditional Owners having sourced native plants, medicines, tools and food here for thousands of years.

Under the plan, efforts include 300 kilometres of fencing to control stock access to waterways, allowing for protection of riparian areas and the natural revegetation of riverbanks. Other works include the removal of invasive willows and woody weeds, and planting of native vegetation.

Project partners are working with local governments, landholders, and community groups on a range of voluntary actions. North Central WaterWatch currently supports volunteers and Djandak staff to regularly monitor the health of Upper Coliban Catchment. Data collected by these citizen science activities provide an important baseline by which to monitor changes in water quality over the life of the plan.

## Summary of 2023 Results

### Average Water Quality Indicators

EC (µS/cm)	pH (Upper)	pH (Lower)	Turbidity (NTU)	PO4 (Mg/L)
177	7.7	7.21	10.7	0.009
Good	Good	Good	Good	Good

### Average Waterbug Indicators

Richness	EPT	Signal
14.8	4.5	4.3



## Discussion of summary

On average, all water quality parameters tested for in 2023 within the project area are classed as good. The only exception is the Coliban River at Lauriston, with pH deemed moderate but only just outside of the acceptable range; nothing of major concern. This is a slight improvement upon the previous year, where two sites had a moderate pH.

Although water quality is good across the project area, macroinvertebrate surveys do not indicate a particularly healthy ecosystem. Macroinvertebrate surveys were conducted at eight sites during October in 2023. Species richness indicated a lack of diversity and was deemed poor at four sites and moderate at the other four. EPT (referring to highly sensitive mayfly, stonefly and caddisfly larvae) was mostly moderate, with the exception of one site rated good and one rated poor.

SIGNAL scores rated better, with four of the eight sites indicating a good result (see next page for more information and glossary).

Rain events were quite regular and intense during spring 2023. This may have had an impact on waterbug assemblages and consequently affected the results of the annual waterbug surveys. Repeat monitoring will occur in 2024 and rain events will be noted. Further investigation, such as pesticide monitoring, may be required to determine the cause of limited waterbug diversity.

### A Healthy Coliban Catchment project achievements to date:





## Citizen Science Activities

- Monthly water quality monitoring at two sites by Djandak staff.
- Eight sites monitored by seven volunteer citizen scientists.
- One macroinvertebrate monitoring workshop, with freshwater aquatic specialist John Gooderham.
- One Pesticide Watch citizen science program activation.
- One school participating in the River Detectives education program.
- One River Detectives incursion at Malmsbury Primary School with a focus on frogs.
- One River Detectives teacher professional development session.

## Pesticide Watch

Pesticide Watch is a citizen science program delivered by Deakin University that aims to improve understanding of how pesticide residues impact our waterways. The program launched in 2023 and partnered with North Central WaterWatch to collect samples at 19 sites across the region.

Within the Healthy Coliban Catchment project area, the Coliban River at Lauriston (NC\_COL380) was sampled for pesticides over six months between April and October. The graph below summarises the abundance of pesticides detected from water samples from this site over this period. The full report can be accessed here [https://www.nccma.vic.gov.au/sites/default/files/publications/pesticide\\_watch\\_2023\\_summary.pdf](https://www.nccma.vic.gov.au/sites/default/files/publications/pesticide_watch_2023_summary.pdf)

(Source: Hamilton, B. 2023. Pesticide Watch 2023 Summary Report, Community Science Project. Deakin University, Burwood).



## Environmental DNA Survey 2023

Environmental DNA (eDNA) is a non-invasive monitoring technique used to detect presence or absence of species using a particular water body. In this case, platypus and fish species were targeted in October 2023, in the Coliban River and its tributaries.

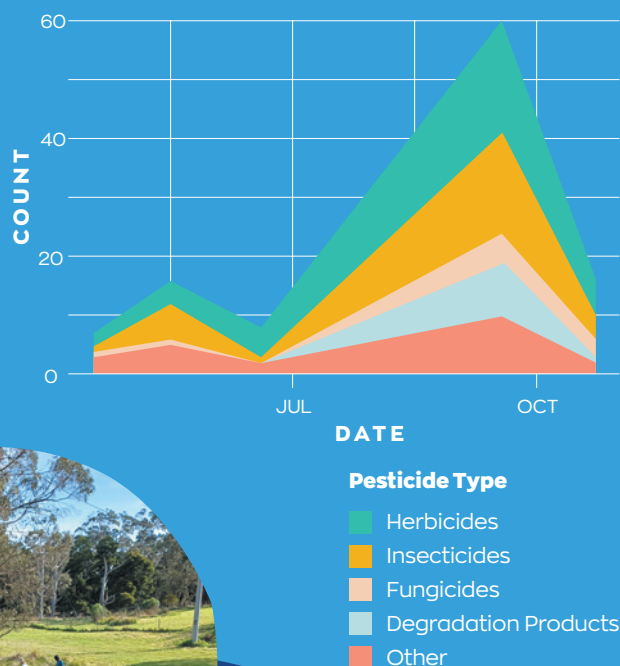
Water samples were collected in duplicate at 22 sites, providing the following results:

- Platypus detected at nine sites (positively or equivocally).
- 16 fish taxa were detected across all sites.
- River blackfish were detected at one site just below Trentham Falls.
- Invasive species largely dominate the fish community, with redfin, brown trout, carp, and roach being the most common. Tench, rainbow trout, and goldfish were also detected.

(Source: Webster, W & Griffith, J (2024). Coliban River Platypus & Fish eDNA Surveys, October 2023. Enviro DNA, Brunswick)



Pesticide Detections Over Time (COL380)



### Kangaroo Creek, Spring Hill Road bridge, Denver

Site Code: KAN360 Average of site visits: 11

This is the most upstream monitoring site on the Kangaroo Creek. It is particularly useful as a control site for the upper Coliban catchment, acting as a baseline for what would be expected from a waterway in its natural condition. It originates from within a heavily forested catchment (the Wombat State Forest) and has an excellent riparian zone.

All water quality indicators were in the optimal range for this region and much the same results as found in 2022.

Waterbug results were varied, but of note is the improved SIGNAL score from poor to good. Richness and EPT scores are much the same as found in 2022.

Water Quality Indicators					Waterbug Indicators		
EC	pH (lower)	pH (upper)	Turbidity	PO4 (Mg/L)	Richness	EPT	Signal
301	7.2	7.4	9	0.02	13	5	5

### Coliban River, Enders Bridge, Trentham Falls Road

Site Code: COL090 Average of site visits: 12

This is the most upstream sites on the Coliban River. Water quality results are good as would be expected in an upstream site coming from a mostly forested catchment with good riparian and verge vegetation. pH has improved since 2022.

Waterbug SIGNAL scores were good, but species richness and EPT were moderate. Limited shade is available at the sampling site and may contribute to this result. This site would likely benefit from additional tree and shrub establishment on the riparian zone.

Water Quality Indicators					Waterbug Indicators		
EC	pH (lower)	pH (upper)	Turbidity	PO4 (Mg/L)	Richness	EPT	Signal
92.5	7.2	7.4	10.9	0	16	4	5

### Stony Creek, Victoria Street (north side), Trentham

Site Code: STO940 Average of site visits: 12

The pretty Stony Creek in Trentham has good water quality and restoration work is evidently in progress. A slight improvement in pH since 2022 is noted.

Waterbug indicators show a moderate richness of species but poor EPT and SIGNAL scores. Being directly downstream from the Trentham township and ornamental lake, this site would be a good candidate for pesticide testing as historical and present land use activities may be contributing to the poor macroinvertebrate scores.

Water Quality Indicators					Waterbug Indicators		
EC	pH (lower)	pH (upper)	Turbidity	PO4 (Mg/L)	Richness	EPT	Signal
107	7	7.6	11	0.003	16	3	3.6

### River Detectives: Malmbsury Primary School

Site Code: COL420\_RD

### Coliban River, Reservoir Road, Lauriston

Site Code: COL380 Average of site visits: 9

Water quality is quite good at this site, with the exception of a slightly alkaline pH.

The waterbug SIGNAL score was good, but species richness and EPT were poor and moderate respectively. Limited shade is available at the site and may contribute to this. Unfortunately, earlier revegetation efforts at this site were severely impacted by flooding in 2022, although the site is in the process of extensive restoration efforts. The site will greatly benefit from additional riparian plantings as part of this work.

Water Quality Indicators					Waterbug Indicators		
EC	pH (lower)	pH (upper)	Turbidity	PO4 (Mg/L)	Richness	EPT	Signal
151	7.5	8.2	9.5	0.1	12	5	4.3

### Little Coliban River, Rippers Lane

Site Code: LIT005 Average of site visits: 8

This site on the Little Coliban River has good water quality results across all parameters.

Waterbug indicators show a moderate species richness but poor EPT and SIGNAL scores. The width of the riparian zone is very narrow at this location and the upper reaches traverse agricultural land. The site also has a heavy willow infestation and would benefit from some restoration activities and additional native vegetation.

This site is quite new to the program, but with Djandak staff committed to ongoing monitoring here, it will be a good site to assess over the long term.

Water Quality Indicators					Waterbug Indicators		
EC	pH (lower)	pH (upper)	Turbidity	PO4 (Mg/L)	Richness	EPT	Signal
236	7.13	8	13	0.01	15	3	4

### River Detectives: Trentham District Primary School

Site Code: TRE010\_RD

### Interpreting results

The results in this report are based on Citizen Science data collected throughout 2023. Water quality data was collected by WaterWatch monitors year-round and macroinvertebrate surveys were completed in mid-spring.

Water quality parameters in this report have been analysed using indicator levels for the North Central CMA region developed in 2022 by Leon Metzeling and David Tiller. These indicators advance upon the State Environment Protection Policy (SEPP) guidelines, used in previous snapshot reports, to determine the ecological health of a waterway. This project lies within the Central Foothills - Campaspe, Loddon, and Avoca sub-segment of the surface water geographic region of the new Environmental Reference Standard (formerly Cleared Hills Bioregion).

Four water quality parameters were monitored: pH, electrical conductivity, reactive phosphorus, and turbidity. Data was analysed for sites with five or more data entries and water quality results are the 75th percentile of all data entries at each site during 2022. For pH, the 25th percentile was also analysed to give an indication of the range of pH and diversion from neutral. The 25th percentile denotes the lower end of the range and the 75th percentile the upper end of the range.

Macroinvertebrate data was analysed at four sites using Agreed Level Taxonomy (ALT) indexes for reference values of freshwater streams.

In 2023, one site was analysed for the presence of pesticides as part of the Pesticide Watch study. Unless exempt from the registration requirement through the Australian Pesticides and Veterinary Medicines Authority (APVMA), unregistered chemical products are illegal and can be dangerous.



Image: John Walter

### 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.
- Very Poor:** Water Quality and aquatic ecosystems are severely impacted.

### Water quality indicator levels

Central Foothills - Campaspe, Loddon, and Avoca sub-segment

Indicator	Electrical conductivity (EC)	pH lower (25th percentile)	pH upper (75th percentile)	Turbidity	Reactive Phosphorus
Units	(µS/cm)	pH	pH	NTU	(mg/L)
Good	≤1,500	≥7.0	≤8.0	≤20	<0.025
Moderate	>1,500 ≤2,000	<7.0 ≥6.0	>8.0 ≤8.5	>20 ≤30	>0.025 ≤0.055
Poor	>2,000 ≤3,000	<6.0 ≥5.0	>8.5 ≤9.0	>30 ≤40	>0.055 ≤0.110
Very Poor	>3,000	<5.0	>9.0	>40	>0.110

### Waterbugs Colour Coding

Sites have been colour coded and interpreted as follows:

	Percentile of index values	ALT Richness	ALT EPT	ALT SIGNAL
<b>Meets or exceeds ALT objectives for a healthy ecosystem</b> Key processes and/or water quality may be slightly impacted, however, most habitats are intact.	30th	≥21	≥6	≥4.2
<b>Close to meeting ALT objectives for a healthy ecosystem</b> Many key processes are not functional; water quality and/or habitat are moderately impacted.	5th - 30th	>16 to <21	>3 to <6	>3.5 to <4.2
<b>Does not meet ALT objectives for a healthy ecosystem</b> Most key processes are not functional and water quality and/or habitat is severely impacted.	5th	≤16	≤3	≤3.5

### Glossary

**ALT** Agreed Level Taxonomy, is the current methodology implemented in Citizen Scientist macroinvertebrate surveying, to aid in the assessment of river and wetland health. The method involves identifying the features and movements of living organisms and means invertebrates can be returned to their waterway after data is collected.

**Richness** Refers to each unique genus identified using the ALT method. Generally, higher diversity of invertebrates reflects a healthier ecology.

**EPT** Ephemeroptera, Plecoptera and Trichoptera, refers to three orders of highly sensitive invertebrates, respectively; mayflies, stoneflies, and caddisflies (identified in their aquatic larval stages) found within Victorian waterways, with a particularly low sensitivity to pollution. Identification of a high count and richness of these invertebrates typically represents a healthy, unpolluted waterway.

**SIGNAL** Stream Invertebrate Grade Number - Average Level, is a simple index which determines each macroinvertebrate's tolerance of pollution. An abundance of macroinvertebrates with both high and low SIGNAL scores is indicative of a healthy waterway ecosystem.

## Want to get involved?

If you're passionate about your local environment, then we need your help!

We're calling on the local community to help keep a watchful eye on the health of our priority waterways.

If you'd like to get involved and become a volunteer citizen scientist, please register your interest with one of our Citizen Science project officers at:

Email: [citizenscienceteam@nccma.vic.gov.au](mailto:citizenscienceteam@nccma.vic.gov.au)

Ph.: (03) 5448 7124

Office: 628-634 Midland Hwy, Huntly Victoria 3551

## Acknowledgement of Country

The North Central Catchment Management Authority acknowledges Traditional Owners and Aboriginal and Torres Strait Islander peoples within the region, including their rich culture and enduring spiritual connection to Country. We also recognise and acknowledge the contributions and interests of Aboriginal peoples and organisations in land and natural resource management.

## Acknowledgements

North Central CMA would like to acknowledge the outstanding contributions made by WaterWatch volunteers, Traditional Owners and project staff involved in A Healthy Coliban Catchment. A Healthy Coliban Catchment is a partnership between North Central CMA, Coliban Water and Dja Dja Wurrung and jointly funded by Coliban Water and the Victorian Government.



Community reference group

This project is jointly funded by Coliban Water and the Victorian Government to deliver catchment stewardship to improve the holistic management of land, water, and biodiversity in and across the upper Coliban catchment. A Healthy Coliban Catchment is one of 11 Our Catchments, Our Communities regional on-ground projects funded from the Victorian Government's \$248 million investment in waterway and catchment health over 2021-2024 and contributes to deliver Action 3.3 of Water for Victoria - invest in integrated catchment management.