

Edward/Kolety-Wakool system Environmental Flows Newsletter

Issue Number 8 | 1 April – 30 June 2021

Edward/Kolety-Wakool Monitoring, Evaluation and Research Program



Adult female Murray River short-necked turtle (Photo: James Van Dyke)

What's in issue #8

**Edward/Kolety-Wakool system
Community Survey – be heard!
Survey closes on 11th July**

Turtle movement study

Annual mid-Wakool River fish survey

Monitoring updates

- Larval fish
- Flows and environmental watering actions

Welcome to Issue 8 of the Edward/Kolety-Wakool Environmental Flows Newsletter - a quarterly newsletter that provides an update on our progress as we monitor and undertake research on the ecosystem outcomes of Commonwealth environmental watering actions in the Edward/Kolety-Wakool system.

The Edward/Kolety-Wakool Monitoring, Evaluation and Research (Flow-MER) Program is a collaboration between universities, state government agencies, consultants and local community organisations. More information on the program can be found at:

<https://flow-mer.org.au/selected-area-edward-kolety-wakool/>
<https://www.csu.edu.au/research/ilws/research/environmental-water>

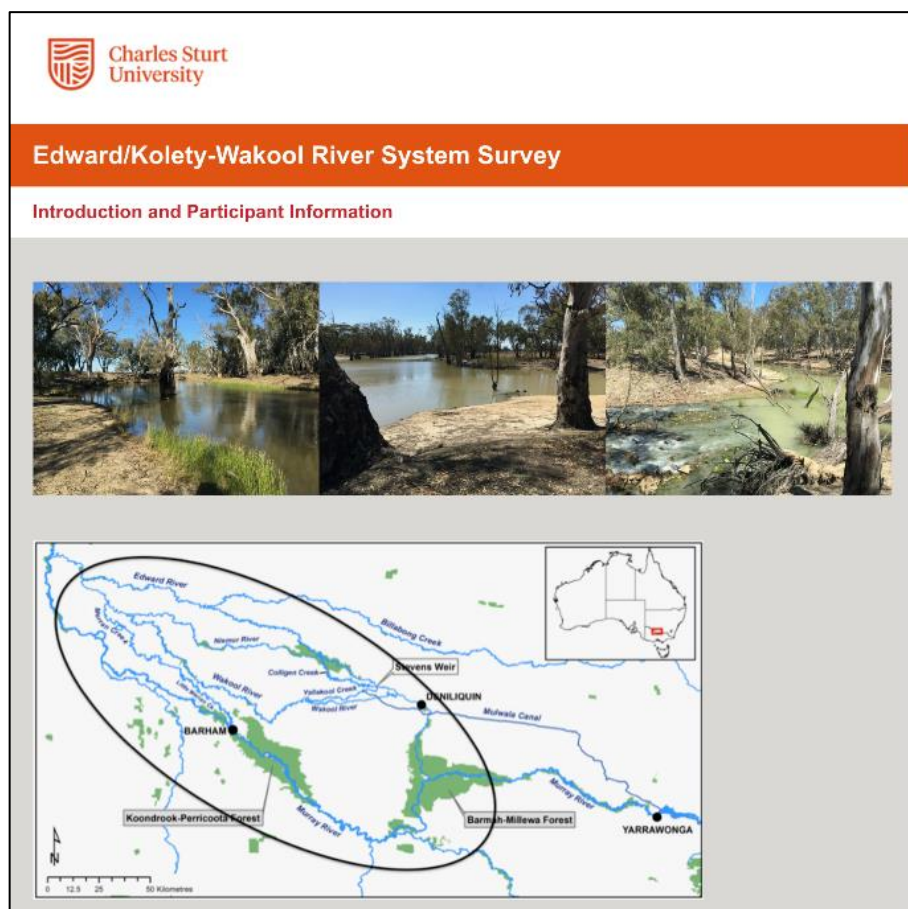


Be heard! Take part in the Edward/Kolety-Wakool System Community Survey!

Knowing how people feel about water for the environment can help water managers and user groups plan their activities and communication. It is important that we don't guess what people think, or assume that everyone thinks the same way, so a survey (questionnaire) has been developed by researchers at Charles Sturt University, with assistance from people who live and work in the Edward/Kolety-Wakool region.

If you have an interest in any part of the Edward-Kolety/ Wakool river system this anonymous survey is an opportunity to share your thoughts.

You can access and complete the survey at this link [Edward/Kolety-Wakool River System Survey](#)



The survey will take less than 20 minutes to complete, and asks questions about your understanding of water and how it is managed in the Edward-Kolety/ Wakool system, what you value in relation to water, and your opinions about water planning. There are plenty of opportunities for you to provide additional written comments.

The survey is open until **11th July 2021**. It can be completed on a phone, tablet or computer. If you would prefer to complete a paper copy, please contact Catherine Allan.

The results of the survey will be made available to water managers, community groups and individuals, to help inform their activities and communication. Key results will also be published in a later issue of newsletter

For an accurate picture of what the broad community knows and cares about in relation to environmental water we need a lot of people to complete the survey. Please consider completing the survey yourself, and passing the link on to others.

If you want to know more about the survey please contact Catherine Allan at Charles Sturt University, callan@csu.edu.au 02 6051 9781

Turtle Movement Study

Since October of 2019, our turtle team has been studying turtle movements in and out of wetlands along the Edward/Kolety River, with the aim of determining how turtles might be influenced by flows. The team includes James Van Dyke from La Trobe University, and Tracy Hamilton, Leticia Ross, and Joe Briggs from Yarkuwa Indigenous Knowledge Centre. The three turtle species that occur in the Edward/Kolety River include the Murray River short-necked turtle (*Emydura macquarii*), broad-shelled turtle (*Chelodina expansa*) (Figure 1), and eastern long-necked turtle (*Chelodina longicollis*). All three species are likely declining due to a number of threats, most especially nest destruction by invasive foxes, and wetland modification.



Figure 1: Broad-shelled turtle (Photo: Leticia Ross)

All three turtle species frequently use wetlands, and they seem to prefer to live in wetlands rather than in the river. As a result, when water levels in the river drop and wetlands become disconnected from the river, turtles may be at risk of exposure when wetlands become dry. This is a major potential threat to turtles in the winter. Turtles are cold-blooded, so if the water drops and exposes them while they are hibernating during winter, they are then at major risk of dying of either exposure to cold air temperatures, or predation by foxes.

We have been tagging and monitoring turtles at six wetlands that vary in their degree of connection to the river (Figure 2). Some of the wetlands are continuously connected to the river, so they never dry completely even if the river is very low. Some of the wetlands are connected to the river only when the river is high, and these wetlands may be at risk of drying during when river level is low. We tagged four short-necked turtles at each wetland (usually 2 males and 2 females) in the summer of 2019-20, and monitored turtles in each wetland from October 2019 until February 2021 to see whether the different wetland types differed in their turtle populations. Up to February 2021 we have trapped over 300 short-necked turtles, 270 long-necked turtles, and 200 broad-shelled turtles across the 6 wetlands.



Figure 2: Joe Briggs checking a turtle trap (Photo: Leticia Ross)

Interestingly, wetland type did not seem to affect short-necked turtle movement. Of our 24 tagged short-necked turtles, all but five left their home wetlands and overwintered somewhere in the river, regardless of how connected their home wetlands were. The females tended to stay 'close to home' in the river adjacent to their home wetland, and went straight back to their wetland again in the spring. The males tended to move very large distances, sometimes over 20 km upstream between Barratta Farm and Moonahcullah Mission! The five female turtles that 'stayed home' did so in wetlands that did not dry over the winter. One of the six wetlands came close to drying during the project, and by February 2020 we caught only a single long-necked turtle there, and all of the tagged turtles had left. This wetland re-filled by November 2020, and two of the tagged turtles returned to it then. We also trapped over 100 long-necked turtles in that wetland after it re-filled (Figure 3), indicating that turtles can rapidly enter wetlands soon after they fill with water.



Figure 3: Eastern long-necked turtles released into shallow water (Photo: Leticia Ross)

Our results suggest that turtles are well-adapted to water level variations in wetlands. There seems to be a strong pattern for most turtles to spend the winter in the river, rather than stay in the wetlands, which would protect those individuals from being exposed in a wetland that dries out in the winter. At the same time, all of the turtles seemed to abandon the one wetland that nearly totally dried, but they returned to it rapidly as soon as it re-filled again.

It is likely that environmental flows provided in the winter could protect turtles that chose to stay in a wetland that was at risk of drying. At the same time, exposure in the winter due to drying wetlands may be a threat that the turtles are able to avoid by leaving those wetlands before winter starts, regardless of whether the wetland is likely to dry or not.

The field work for the turtle movement study has been completed and the results will be analysed and presented in the 2020-21 annual Edward/Kolety-Wakool MER report that will be available on the [CSU MER project webpage](#) later this year. Turtle monitoring will be continued through a project funded by Murray Local Land Services.

Annual mid-Wakool River fish survey

NSW Department of Primary Industries, with field assistance from Charles Sturt University, have completed the annual survey of fish populations in the mid-Wakool River. This annual survey in the Wakool River complements the larger-scale fish survey of 20 sites across the Edward/Kolety-Wakool River system that is undertaken every three years (next large-scale fish survey will be undertaken in 2022).

The team uses an electrofishing boat which sends a current of electricity into the water to temporarily stun hiding or swimming fish, and fyke nets with the wings of net leading to a netted holding chamber to trap swimming fish. Using different methods targets a range of fish species from tiny small-bodied fish a few millimetres long to adult Murray cod reaching over 1 m in length (Figure 4). Once captured, fish are identified, counted, measured for length and weight and then released. This was the seventh annual fish sampling trip using consistent sampling methods at ten sites.

The team is following trends in native and introduced fish species present, and the numbers and weights of each fish species. They also monitor for new recruits or juvenile fish which were born in the previous spawning season (typically from September to December). These fish are less than 1 year old and referred to as “young-of-year”. For a fish species to maintain its population, young-of-year are important because they can replace the adults that inevitably die each year. Species that are no longer present, occur in much lower numbers or biomass than previous years, or are not producing young-of-year fish may be of concern. Whereas, those species that are present at stable or increasing numbers and biomass, and have good numbers of young-of-year present, could indicate that populations are being sustained or improving.

In May 2021, nine native and three introduced fish species were caught in the mid-Wakool system. This was similar to the number of species caught in previous years.



Figure 4: Clockwise from top left: Images of adult Murray cod, juvenile Murray cod, adult silver perch and sub-adult golden perch caught in fish sampling in the mid-Wakool River. (Photos: NSW DPI and John Trethewie, CSU)

Some of the key observations from the fish surveys in May 2021 include:

- The native small-bodied flathead gudgeon re-appeared for the first time since the 2016-17 flood/hypoxia event that caused substantial fish kills.
- Native Murray cod numbers have increased since the 2016-17 flood/hypoxia event. Number of young-of-year Murray cod have also increased over recent years.
- Native golden perch populations showed signs of improvement, unlike other years after the 2016-17 flood/hypoxia event. Total numbers and weights had increased compared to recent years, however no young-of-year were found. Despite this, sub-adult golden perch (100–300 mm) were caught for the first time since the monitoring program began in 2014. It is unlikely these sub-adult golden perch were spawned and recruited locally, as golden perch eggs or larvae have not been detected in 7 years of fish sampling in the Edward/Kolety-Wakool system. Fish may have come from the nearby Murray River or could be fish stocked into the river from a hatchery (this will be confirmed by further analysis).
- Native silver perch were also in higher total numbers in 2021. The increased numbers are likely explained by fish originating from the Murray River, as there was no evidence of local spawning and recruitment for this species in 2019-20 or 2020-21.

Overall, the native fish populations in the EKW river system were maintained in 2020-21, and some species have increased in abundance. Murray cod in particular have increased following the 2016-17 flood/hypoxia event, but it is unclear to what extent environmental watering actions contributed to this change. Populations of some native fish species, such as golden perch and silver perch, that have not produced young-of-year fish locally may be at risk, but individuals either immigrating into or being stocked within the Edward/Kolety-Wakool river system could be supporting these populations. The team's work so far and in years to come is key to understanding fish community responses to Commonwealth environmental water and determining how best to use this water to support fish.

Update on Monitoring

Larval Fish Monitoring Update

Larval fish monitoring for the 2020-21 season concluded in early March. Surveys were undertaken fortnightly between September 2020 to March 2021 in Yallakool Creek and the Wakool River. This monitoring has been undertaken each year since 2014 to identify which fish species have spawned, where and when they spawned and under what environmental conditions. Samples are currently being processed in the laboratory at Charles Sturt University in Albury.

Surveys were also undertaken weekly between October and February in the Edward/Kolety River downstream of Stevens Weir as part of a collaborative citizen science research program with the Edward-Wakool Angling Association (EWAA) ([see story in newsletter #7](#)). Preliminary results from the Edward/Kolety River show a small number of fish eggs were drifting in November and Murray cod larvae were detected in November and December. No silver perch or golden perch larvae were detected in 2020-21. The eggs will be tested by DNA analysis to determine their species, and the cod larvae will also be tested to determine if any are trout cod. The EWAA citizen science research on fish spawning in the Edward/Kolety River downstream of Steven's Weir has been funded into for the upcoming year, ensuring three consecutive years of larval sampling.

Flows Update

In early May the regulator gates at the Edward/Kolety River Offtake and Gulpa Offtake were lifted clear of the water, meaning that flows into the system varied in accordance with water levels in the Murray River through most of May and all of June 2021. On 15 May WaterNSW began to lower Stevens's weirpool (Figure 5) and lifted the regulator gates clear of the water to undertake essential maintenance work.

There will be no flows or environmental watering actions in the Wakool River, Yallakool Creek or Colligen Creek until Stevens Weir is reinstated, or unless a high flow event on the Murray increases water levels in the Edward/Kolety River sufficiently to enable commence to flow in these rivers and creeks.

Planning for environmental watering actions in 2021-22 is underway and has been discussed with the Edward/Kolety-Wakool Environmental Water Reference Group. Planned environmental watering actions may include watering of Werai Forest, and within-channel flow pulses in Wakool River, Yallakool Creek and Colligen Creek. An update on watering actions will be provided in Newsletter #9 (September 2021).



Figure 5: Low water levels in Stevens Weir, 7th June 2021 (Photo: Paul Frazier)

More information

To join the newsletter mailing list please subscribe [here](#) or contact Professor Robyn Watts, Institute for Land, Water and Society, Charles Sturt University, Albury NSW. rwatts@csu.edu.au

We respectfully acknowledge the Wamba Wamba or Wemba Wemba, and Perrepa Perrepa or Barapa Barapa peoples, traditional owners of the land on which the Edward/Kolety-Wakool program is focussed. We recognise their unique ability to care for Country and their deep spiritual connection to it. We honour Elders past, present and emerging whose knowledge and wisdom has ensured the continuation of culture and traditional practices. The Edward/Kolety-Wakool team would also like to acknowledge the local landholders with whom we work and thank them for their contribution to the monitoring and research.

Trethewie J., Allan C., Minato W., Van Dyke J., Thiem J, Wright D., McCasker N., Watts R.J. (2021) Edward/Kolety-Wakool System Environmental Flows Newsletter, Issue 8. Charles Sturt University.