

Edward/Kolety-Wakool system Environmental Flows Newsletter

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Edward/Kolety-Wakool Monitoring, Evaluation and Research Program



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Welcome to the first issue of the Edward/Kolety-Wakool Environmental Flows Newsletter - a quarterly newsletter that will provide updates 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 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>



Edward/Kolety-Wakool Flow-MER program

The Edward/Kolety-Wakool Monitoring, Evaluation and Research (MER) program (2019-2022) is a continuation and enhancement of the previous five-year Long-Term Intervention Monitoring (LTIM) monitoring program (2014-2019). It is funded by the Australian government to investigate the outcomes of Commonwealth environmental water delivered to the Edward/Kolety-Wakool system as part of the Murray-Darling Basin Plan.

The system is a complex network of interconnected rivers and streams in a productive agricultural landscape. The area has a rich and diverse Indigenous history and supports recreational activities such as fishing, boating and bird-watching.

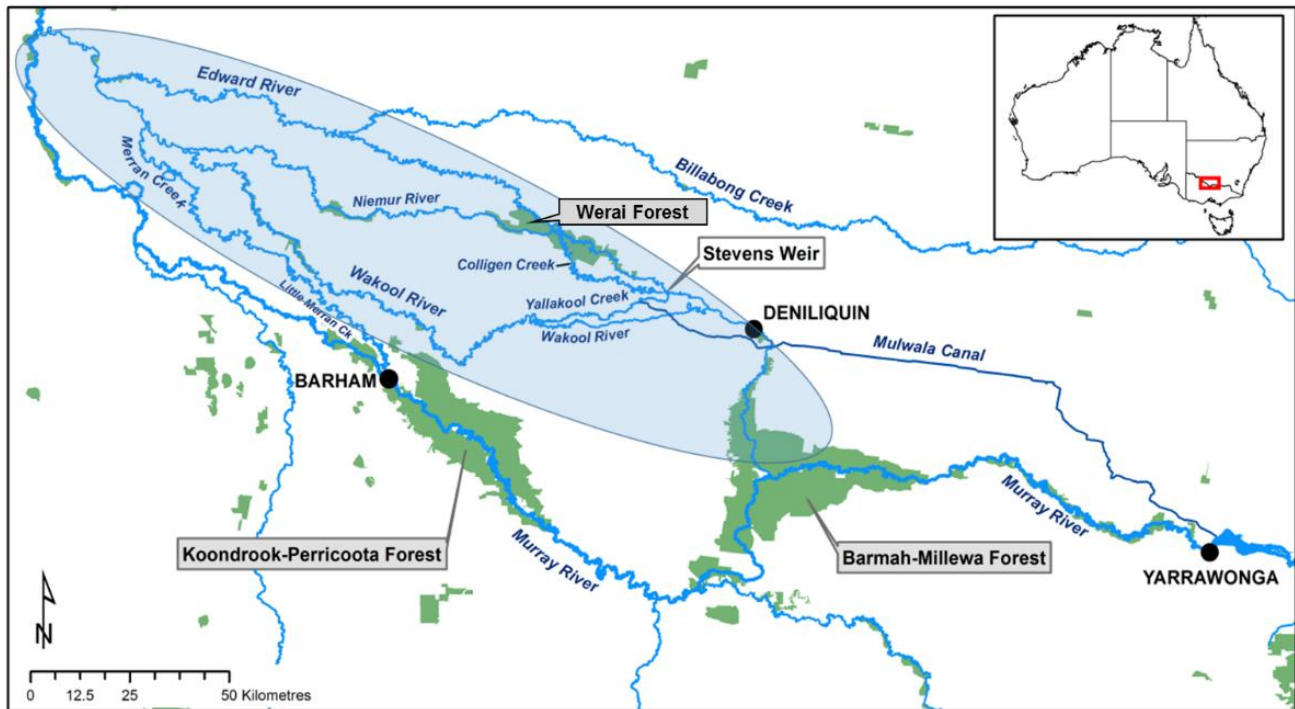
Under regulated conditions flows remain within the river channels, whereas during unregulated high flows there is connectivity between the river channels, flood-runners, wetlands, floodplains and several large forests.

The Edward/Kolety-Wakool system has high native species richness and diversity and provides refuge and nursery areas for fish and other aquatic organisms. It plays an important ecological role in connecting upstream and downstream ecosystems in the mid-Murray River. The MER program focuses on understanding how native fish, vegetation, water quality and processes that support and sustain aquatic food webs are influenced by environmental watering actions.

The MER program consists of three major components:

1. **Core monitoring**
2. **Research**
3. **Community engagement and communications**

Through collaboration with managers and other stakeholders the results from the Edward/Kolety-Wakool MER program will be used to inform the adaptive management of environmental water.



Map showing the main rivers and tributaries in the Edward/Kolety-Wakool system

Monitoring

We are using a whole of ecosystem approach to evaluate the responses to environmental water in the Edward/Kolety-Wakool system. We monitor:

- **Hydrology** – We use data from flow gauges and information from water accounts to determine the contribution of environmental water to changes in flow and water level in the river system
- **Water quality** - We monitor water quality at 20 sites throughout the river system to inform us about water quality conditions under different flows.
- **Ecosystem metabolism** – Through continuous monitoring of dissolved oxygen in the water by data loggers, we calculate daily production of oxygen (photosynthesis) by plants and algae and consumption of oxygen (respiration) by bacteria and other organisms
- **Riverbank and aquatic vegetation** – We monitor the cover and species richness of riverbank and aquatic vegetation, which provides food and habitat for aquatic animals and can help to stabilise riverbanks and reduce erosion.
- **Fish spawning** - We monitor fish spawning at twenty sites using light traps and drift nets that are deployed once a fortnight during spring and summer
- **Fish recruitment** – We monitor recruitment of Murray cod, silver perch and golden perch in February each year to assess the survival of larvae hatched that year (young-of-year) or in the previous year (1+ individuals).
- **Fish populations** - We monitor fish through an annual survey in the mid-Wakool River. We will monitor fish at 20 sites throughout the system in year 3 (2022) of the project. These sites have been monitored 7 times since 2009 and this project will contribute to the long-term dataset.



Monitoring aquatic vegetation.



Monitoring water quality

Ecosystem responses to environmental watering are evaluated in two ways:

- Indicators that respond quickly to flow** (e.g. water quality) are evaluated for their responses to each environmental watering action. These indicators are evaluated with respect to the total discharge (including environmental water) and the discharge without the environmental water.
- Indicators that respond over longer time frames** (e.g. vegetation, fish populations) are evaluated for their response to the flow regime. Data from reaches that have received environmental water over multiple years are compared with data from reaches that have received a different pattern of environmental water or no environmental water.

Research

We are undertaking an integrated research and community engagement project to address physical, ecological, and social questions about the Edward/Kolety River. The research is being undertaken in partnership with Yarkuwa Indigenous Knowledge Centre, the Edward-Wakool Angling Association and the Western Murray Land Improvement Group.

We will examine how flows influence physical and ecological processes in the Edward/Kolety River. The research will help answer questions on the following themes:

- lateral connectivity under operational and environmental flows
- changes in the condition of river banks under operational and environmental flows
- river productivity under operational and environmental flows
- wetland plant emergence and survival in Werai Forest
- turtle movement and condition
- fish spawning in the Edward/Kolety River

Social research will be integrated with the biophysical research to explore stakeholder perceptions and their involvement in monitoring and water management.



Turtle research is being undertaken in collaboration with Yarkuwa Indigenous Knowledge Centre



Using drones to study changes in the condition of riverbanks



Research on fish spawning in the Edward/Kolety River in collaboration with the Edward-Wakool Angling Association



Low-lying areas in Werai Forest are the focus of vegetation research

Community engagement and communications

As part of the MER program we will organise events and activities to communicate the findings and provide local people an opportunity to be involved in the monitoring and research.

Results will be shared through collaborative research projects in partnership with community organisations, presentations to the Edward/Kolety-Wakool Environmental Water Reference Group, workshops and field days, through the FLOW-MER website, and through local newspaper articles and the quarterly newsletters. Keep an eye-out for upcoming events in your area!

Community organisations currently involved in research and activities include Yarkuwa Indigenous Knowledge Centre, Edward-Wakool Angling Association, and the Western Murray Land Improvement Group. We are keen to develop activities with other community organisations.

We will contribute to on-going adaptive management of environmental water by working with water managers and other stakeholders to develop annual and long-term watering plans for the system.



More information

To join the newsletter mailing list please contact Professor Robyn Watts, Institute for Land Water and Society, Charles Sturt University, Albury NSW rwatts@csu.edu.au or ilws@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.

Watts, R.J. (2019) Edward/Kolety-Wakool System Environmental Flows Newsletter, Issue 1. Charles Sturt University.