

Long Term Intervention Monitoring Project Murrumbidgee System

Selected Area Project Progress Report #15

Report period: 1 January – 31 March 2018



Telephone Creek, Nimmie-Caria, March 2018

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Ecological responses to Commonwealth environmental water in the Murrumbidgee system as of 31 March 2018

This quarterly report outlines key activities undertaken and preliminary outcomes identified during monitoring of ecosystem responses to the use of Commonwealth environmental water in the Murrumbidgee Catchment undertaken as part of the Murrumbidgee Long Term Intervention Monitoring (LTIM) Project between 1 January and 31 March 2018. Monitoring includes assessment of ecological outcomes in the Murrumbidgee River and connected wetlands through the mid-Murrumbidgee and Lowbidgee floodplain wetlands as outlined in [the Murrumbidgee Monitoring and Evaluation Plan](#).

All 4 wetland sites monitored in the mid-Murrumbidgee, as well as Mercedes and Waugorah Lagoons in South Redbank, were watered or partially watered by environmental flows, delivered as a high-flow fresh during September 2017. The remaining 6 sites were either dry (Piggery Lake) or remained partially wet following widespread flooding and subsequent environmental water deliveries to support waterbird breeding during 2016-17. Much of the system was allowed to dry during 2017-18, and many sites were dry by March 2018.

Preliminary outcomes to 31 March 2018

Routine wetland monitoring activities targeting water quality, microinvertebrates, fish, frogs and tadpoles, and waterbirds were completed at the 12 Murrumbidgee LTIM wetland sites (refer Appendix 1 and 2) during January and March 2018. Indicators were only monitored where there was sufficient water to do so (see appendix 1).

Vegetation communities

By January and March, the majority of LTIM wetland monitoring sites were dry or contained small amounts of residual water. As expected given the dry conditions there is a lower diversity of aquatic plant species and higher percentage of bare ground and leaf litter with annual terrestrial species colonising dry sections of the wetland. Small numbers of river red gum seedlings are germinating at Piggery Lake and Waugorah Lagoon. This species is known to recruit in high numbers after flooding and requires further inundation to control the number of trees that reach maturity.



a) Mercedes Swamp, January 2018 and b) Waugorah Lagoon, March 2018, with red gum seedlings in the foreground.

Water Quality

During January and March all sites showed some signs of declining water quality (increased conductivity, turbidity, high concentrations of algae and highly variable dissolved oxygen). These conditions often develop in wetlands as water evaporates and the concentrations of dissolved and particulate materials become more concentrated.



Water quality sampling at McKennas Lagoon, January 2018.

Frogs and tadpoles

Few frogs were observed or heard calling during January 2018. Adult southern bell frogs (*Littoria raniformis*) were seen at all sites in the Nimmie-Caira zone as well as Yarradda Lagoon. Small numbers of marsh frog tadpoles were seen at a few sites, particularly Mercedes Swamp which was inadvertently inundated by high water levels in Redbank Weir during December 2017. During January, a small number of southern bell frogs were heard calling at Mercedes Swamp in response to this watering, the first time they've been detected in south Redbank, outside of Waugorah Lagoon, since 2013. By March no frogs of any species were heard calling and only two barking marsh frog (*Limnodynastes fletcheri*) adults were observed.



Perron's tree frog (*Littori perronii*) at Waugorah Lagoon, January 2018.

Waterbird diversity

As expected with a high number of dry sites, a low diversity and abundance of waterbirds was observed across the Lower Murrumbidgee and mid-Murrumbidgee during January and March 2018. Some feeding waterfowl and large wader species were seen at nearby waterbodies in the Nimmie-Caira system that still held some water. Fish-eating waterbirds and ducks were observed in Yarradda and Gooragool Lagoons which held the most water compared to other wetlands in the mid-Murrumbidgee zone. Few active waterbird colonies were detected, although nesting darter were observed (January 2018) and a small number of Great Cormorant nests (5; March 2018) were reported for Yarradda Lagoon. The highest diversity of species was at Yarradda Lagoon with 13 individual species identified.



A lone grey teal (*Anas gracilis*), Nap Nap Swamp, Nimmie-Caira zone, January 2018.

Fish and turtles (wetlands)

During 2017-18 few fish were captured in wetlands, compared to previous years. This includes fewer common species like native carp gudgeon (*Hypseleotris* spp.) and introduced European carp (*Cyprinus carpio*). During January and March 2018 the largest catch, in terms of species and density, was at Yarradda lagoon. One redfin perch (*Perca fluviatilis*) was captured at Gooragool Lagoon during January 2018. No large or medium-bodied species were recorded at any site.

Eighteen turtles were captured in fyke nets during January 2018 and only 2 during March 2018. Catches were predominantly eastern long-necked turtles (*Chelodonia ongcollis*). One 3.5cm long Macquarie River Turtle (*Emydura macquarii*) was captured at Yarradda Lagoon and one larger individual at Waugorah Lagoon, both during January 2018. Many sites were dry during the January and March 2018 surveys and low abundances do not reflect a net decline of turtles compared with past results.



A large Murray River Turtle (*Emydura macquarii*) observed at Waugorah Lagoon, south Redbank, January 2018.

Appendix 1 Summary of monitoring activities undertaken during January (J) and March (M) 2018 as part of the Monitoring and evaluating ecological responses to Commonwealth environmental water use in the Murrumbidgee River Valley

Zone	Site name	Estimated Status (March)	Water Quality	Microinvertebrates Chlorophyll A	Carbon Nutrients	Ecosystem metabolism	Larval fish	Riverine fish	Tadpoles, fish and turtles	Frogs	Waterbirds	Vegetation			
mid-Murrumbidgee	Gooragool	Dry	J	J	J				J	J	J/M	J/M			
	Mckennas	Dry	J							J	J/M	J/M			
	Sunshower	Dry									J/M	J/M			
	Yarradda	½ full	J/M	J/M	J/M				J/M	J/M	J/M				
South Redbank	Mercedes	Dry	J	J	J						J	J	J/M	J/M	
	Two Bridges	Dry									J	J	J/M	J/M	
	Piggery Lake	Dry											J/M	J/M	
	Waugorah Lagoon	Channel only (low)	J/M	J/M	J/M				J/M	J/M	J/M	J/M	J/M	J/M	
Nimmie-Caira	Nap Nap	Dry											J	J/M	J/M
	Avalon	Dam-only	J/M	J/M	J/M						J/M	J/M	J/M	J/M	J/M
	Telephone	¼ full	J/M	J/M	J/M						J/M	J/M	J/M	J/M	J/M
	Eulimbah	Dry									✓	✓	J/M	J/M	J/M
River sites	McKennas (Carrathool zone)		Complete: October-December 2017			Compl. (Apr18)	Complete: October-December 2017	Mar/Apr							
	Bringagee (Carrathool zone)														
	Yarradda (Carrathool zone)														
	Narrandera (Narrandera zone)					Compl. (Dec17)									
	Euroley (Narrandera zone)														
	Dairy (Narrandera zone)														

Appendix 2

About the Murrumbidgee Long-Term Intervention Monitoring Project (LTIM Project)

The Long Term Intervention Monitoring (LTIM) Project for the Murrumbidgee River system is funded by the Commonwealth Environmental Water Holder (\$3.7M 2014-2019) and is being delivered as a collaborative partnership led by Charles Sturt University (Institute for Land, Water and Society) with NSW Department of Primary Industries (Fisheries), University of NSW, NSW Office of Environment and Heritage, and Riverina Local Land Services.

The Murrumbidgee LTIM Project is designed to provide a robust framework to evaluate the ecological outcomes of Commonwealth environmental water within wetland and river systems downstream of Narrandera, NSW. Monitoring activities target multiple taxonomic groups and ecological processes with a focus on indicators of high ecological and community significance, such as large bodied native fish, waterbirds, and endangered species.

Monitoring activities within wetlands are focused on the responses of fish, frogs, tadpoles, turtles, microcrustacea (a component of the zooplankton), waterbirds, vegetation, along with the changes in water quality, carbon and nutrients associated with black water and algal bloom risks, and hydrology measured before, during and after environmental watering. The riverine component includes intensive monitoring of native fish breeding and fish community responses to environmental watering actions, along with microcrustacea, stream metabolism (stream productivity) and water quality associated with black water and algal bloom risks, and hydrology.

The Murrumbidgee LTIM Project is being undertaken across three key ecological regions within the Murrumbidgee, the mid and lower Murrumbidgee River channel and adjacent mid-Murrumbidgee wetlands between Narrandera and Hay, and the Lowbidgee floodplain downstream of Maude, that is further divided into separate monitoring “zones” representing areas with common ecological and hydrological attributes.

The framework includes 12 fixed monitoring sites across three key wetland types, oxbow lagoons of the Mid-Murrumbidgee, lignum-black box wetlands through the Nimmie-Caira system and river red Gum-spike rush wetlands through the Redbank systems and six fixed sites across the mid and lower the Murrumbidgee River channel. Copies of the Murrumbidgee Monitoring and Evaluation plan are available at:

<http://www.environment.gov.au/system/files/resources/bc51ee00-ac5f-4e65-910d38f23416823e/files/murrumbidgee-me-plan.pdf>

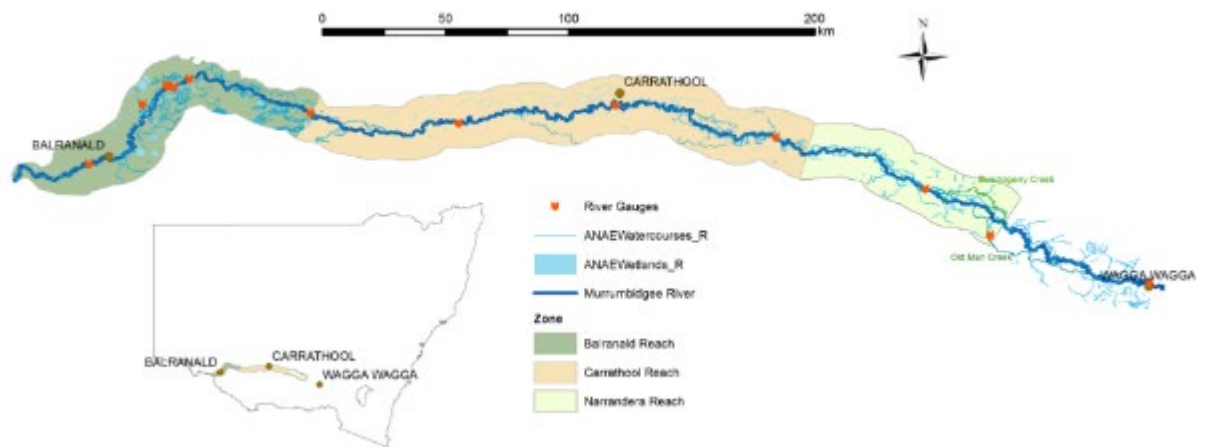


Figure 2 Distribution of riverine zones in the Murrumbidgee Selected Area.

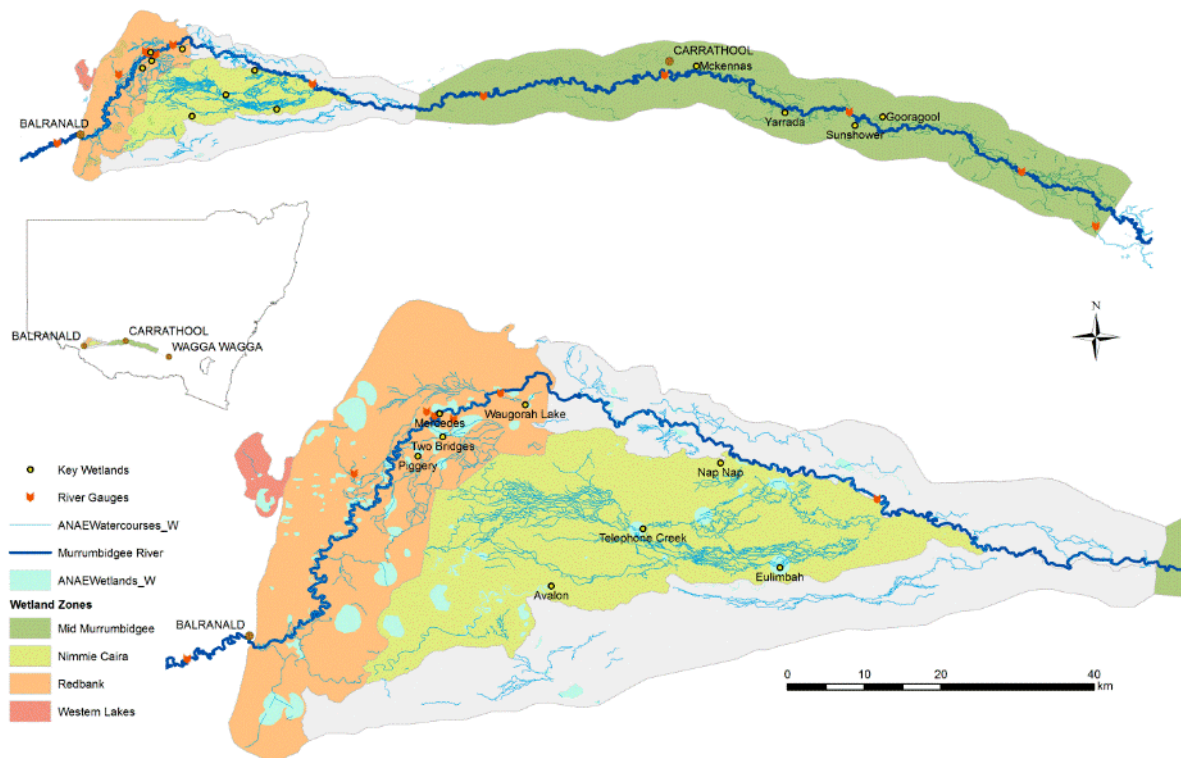


Figure 3 Distribution of wetland zones in the Murrumbidgee Selected Area and locations of key wetlands.