



Long Term Intervention Monitoring Project Murrumbidgee System Selected Area Project Progress Report #17 Report period: 1 July 2018 – 30 September 2018



Piggery Lake, Lower Murrumbidgee, September 2018.

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Ecological responses to Commonwealth environmental water in the Murrumbidgee system as of 30 September 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 July and 30 September 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.

Half of the twelve wetland sites were either dry or contained insufficient water to set nets. Redbank, Two Bridges and Piggery Lake were receiving water, Wagourah Lagoon contained residual water, and Mercedes was dry. In Nimmie-Caira, Nap Nap had water remaining from the Autumn refuge flow, Telephone Creek was fairly low, and Avalon Dam contained insufficient water to sample. Water was entering Eulimbah from the south Caira canal at the time of monitoring. In the mid-Murrumbidgee, only Yarradda contained a small amount of residual water.



Looking back to the treeline from the centre of Mercedes Lagoon, September 2018.

Preliminary outcomes to 30 September 2018

There was insufficient water to monitor all indicators at all 12 Murrumbidgee LTIM wetland sites during September 2018. Routine wetland monitoring activities targeting water quality, microinvertebrates, fish, frogs and tadpoles, and waterbirds were completed at six sites (refer Appendix 1 and 2), with a reduced number of indicators recorded at sites that contained insufficient water to set nets (2 sites). Four sites were completely dry.

Water Quality

Overall water quality remains good in most wetlands. Both Yarradda Lagoon and Avalon Dam had high levels of turbidity associated with very low water levels, and high numbers of carp were observed at Yarradda.

Vegetation

As expected aquatic vegetation cover was very low during the September surveys, mainly due to a combination of cool conditions and the high number of sites being dry. The majority of sites displayed a high percentage of leaf litter and bare ground, however sites that had received some water in the months prior to the survey supported small numbers of native annual ground cover species, including lesser joyweed and waterwort. The cover of aquatic species is expected to increase over summer.



Ground cover vegetation at Yarradda Lagoon, September 2018.

Frogs and tadpoles

Frog activity is typically low over the colder months and relatively few frogs were observed or heard during the September 2018 surveys. Frog observations were dominated by spotted and barking marsh frogs (*Limnodynastes* sp.) plains froglet (*Crinia parinsignifera*), and Peron's tree frogs (*Litoria peronii*). Banjo frogs (*Limnodynastes interioris*) were also heard calling at several sites, and one adult was observed at Two Bridges. A small number of *Limnodynastes* (spotted and barking marsh frog) tadpoles (9) were caught at Telephone Creek. Southern bell frogs (*Litoria raniformis*, EPBC Act listed as Vulnerable) were heard calling at Eulimbah and Nap Nap Swamp, a few were observed in the water and amongst vegetation.

Waterbird diversity

As most sites were dry or only recently filling waterbird responses were low across survey sites during the September 2018 surveys. We recorded a total of 21 water-dependent bird species, including a notable flock of 60-70 red-necked avocets feeding at Yarradda Lagoon (see plate). We expect waterbird activity to increase in Yanga National Park in the following weeks with increasing temperatures and the recent delivery of environmental water.



Red-necked avocet activity at Yarradda Lagoon, September 2018.

Fish (wetlands)

Relatively few fish were captured in fyke nets during September 2018 wetland surveys. Most fish were captured in the Redbank sites. The most commonly recorded species were carp gudgeon, ranging in size from small to large. Also present in very small numbers were native rainbowfish, smelt, bony bream and introduced carp, weather loach and goldfish.

Eastern long-necked turtles were captured at Wagourah (5) and Two Bridges (2).



Eastern long-necked turtle at Wagourah Lagoon, September 2018.

Appendix 1 Summary of monitoring activities undertaken during September 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	Water Quality	Microinvertebrates Chlorophyll A	Carbon Nutrients	Ecosystem metabolism	Larval fish	Riverine fish	Tadpoles, fish and turtles	Frogs	Waterbirds	Vegetation
mid- Murrumbidgee	Gooragool	Dry	dry	dry	dry				dry	dry	\checkmark	\checkmark
	Mckennas	Dry	dry	dry	dry				dry	dry	\checkmark	✓
	Sunshower	Dry	dry	dry	dry				dry	dry	>	~
	Yarradda	Very low	✓	✓	\checkmark				low	✓	~	✓
South Redbank	Mercedes	Dry	dry	dry	dry				dry	dry	~	\checkmark
	Two Bridges	Filling	\checkmark	✓	✓				\checkmark	\checkmark	\checkmark	\checkmark
	Piggery Lake	1/3 full	✓	\checkmark	\checkmark				\checkmark	\checkmark	\checkmark	\checkmark
	Waugorah Lagoon	Channel only	\checkmark	\checkmark	\checkmark				\checkmark	\checkmark	\checkmark	\checkmark
Nimmie-Caira	Nap Nap	¼ full	\checkmark	\checkmark	\checkmark				\checkmark	\checkmark	\checkmark	\checkmark
	Avalon	Dam-only	\checkmark	✓	\checkmark				low	\checkmark	~	\checkmark
	Telephone	¼ full	\checkmark	✓	\checkmark				~	\checkmark	~	\checkmark
	Eulimbah	Water entering	✓	✓	✓				~	✓	~	✓
River sites	McKennas (Carrathool zone)			18		Oct 18	18	or				
	Bringagee (Carrathool zone)		October 20				October 20:	1ar/A 2019				
	Yarradda (Carrathool zone)							2				
	Narrandera (Narrandera zone)			ences (Oct 18	ences (
	Euroley (Narrandera zone)		эщие он				imme					
	Dairy (Narrandera zone)			ŭ			Ū					

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-4e65-910d 38f23416823e/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.