



Long Term Intervention Monitoring Project Murrumbidgee System Selected Area Project Progress Report #10 Report period: 1 July – 30 September 2016



Gooragool Lagoon, Mid-Murrumbidgee, September 2016

Wassens, S., Wolfenden, B., Spencer, J., Thiem, J., Jenkins, K., Lenon, E., Hall, A., (2016). Long Term Intervention Monitoring Project, Murrumbidgee System Selected Area, Progress Report number 9, September 2016. Charles Sturt University, Institute for Land, Water and Society. Prepared for the Commonwealth Environmental Water Office.

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Ecological responses to Commonwealth environmental water in the Murrumbidgee system as of 30 September 2016

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 2016. 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](#).

To date in 2016-17 the delivery of Commonwealth environmental water has been paused due to moderate flooding. Widespread rain and associated high river flows during September have inundated all LTIM monitoring sites in the mid-Murrumbidgee and south Redbank zones. High river flows are currently entering the Nimmie-Caira zone with state agencies carrying out flood mitigation works to protect water management infrastructure.

Preliminary outcomes to 30 September 2016

Wetland vegetation communities were surveyed at all sites in the Redbank (4) and mid-Murrumbidgee (4) zones at the beginning of September. Monitoring of water quality, microinvertebrates, fish, frogs and tadpoles, and waterbirds were completed at the four wetland sites in the mid-Murrumbidgee zone (refer Appendix 1 and 2). However, access to the Redbank and Nimmie-Caira zones has since been restricted by wet weather and sampling will be completed once rainfall eases. Sample processing for microinvertebrates, carbon and nutrients and vegetation surveys are now underway. Monitoring of riverine larval fish will commence in October 2016. River fish monitoring is scheduled to be carried out across 10 sites across the Carrathool zone in March and April, 2017. Metabolism monitoring, conducted at Carrathool and Narrandera, has been delayed by flooding but will commence as soon as site access is restored and be completed in April 2017.

Preliminary observations made during the September 2016 surveys of the mid-Murrumbidgee wetlands are presented here.

Water Quality

During September all mid-Murrumbidgee wetland sites (Yarradda Lagoon, Sunshower Lagoon, Gooragool Lagoon and McKennas Lagoon) were full and connected with the river. Most sites were in the early stages of filling and, as this coincided with cool temperatures, daytime dissolved oxygen concentrations remained within the normal range (>4mg/L).

Vegetation

Vegetation surveys were undertaken through the mid-Murrumbidgee and Redbank LTIM sites between the 4th and 7th of September 2016. As expected given the time of year and cool temperatures, aquatic vegetation cover was low through the majority of wetlands, with small patches of wavy marshwort, common spike rush and nardoo re-establishing through Piggery Lake, Mercedes Swamp and Two Bridges swamp. There was significant flowering of Lignum through Waugorah Lagoon (Plate 1).

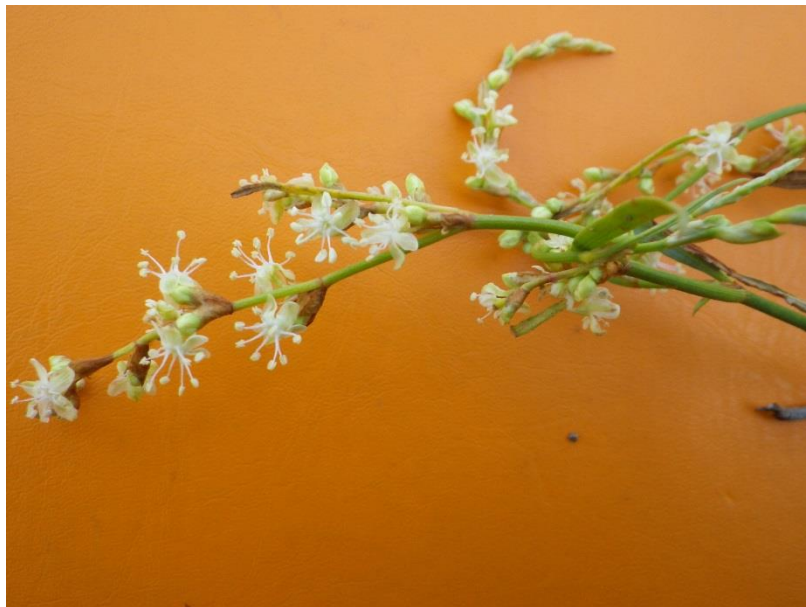


Plate 1. Lignum flowering Waugorah

Frogs and tadpoles

Moderate numbers of marsh froglet (*Crinia parainsignifera*) and spotted marsh frog (*Limnodynastes tasmaniensis*) were heard calling across all mid-Murrumbidgee wetland sites. No tadpoles were observed, but this is not uncommon at this time of year and at sites that have been very recently inundated. Other frog species (particularly southern bell frog – *Litoria raniformis*) are more likely to be detected later in the water year as temperatures increase.



Plains froglet at Waugorah Lagoon (*Crinia parainsignifera*)

Waterbird diversity

Waterbird diversity was surveyed at the four mid-Murrumbidgee LTIM wetland sites from 13 -15 September 2016. In total 13 wetland-dependent bird species were observed across the four wetlands with waterbird numbers were dominated by dabbling ducks including grey teal, Pacific black duck, pink-eared duck and hardhead. Multiple broods of grey teal were observed at Mckennas Lagoon. We expect waterbird diversity, abundance and breeding activity of other species to increase across warmer spring and summer months.

Fish (wetlands)

Golden perch (*Macquaria ambigua*) were captured at Gooragool, Sunshower and McKennas Lagoons. Captured individuals were largely adults >250 mm. One smaller golden perch (56mm) was captured at Sunshower Lagoon. Carp gudgeon (*Hypseleotris* spp.), Eastern gambusia (*Gambusia holbrooki*) and goldfish (*Carassius auratus*) were numerically dominant while relatively high number of Australian smelt (*Retropinna semoni*) were also captured.



Golden perch (*Macquaria ambigua*) at Gooragool Lagoon, September 2016.

Appendix 1 Summary of monitoring activities undertaken during September 2016 as part of the Monitoring and evaluating ecological responses to Commonwealth environmental water use in the Murrumbidgee River Valley.

Zone	Site name	Status (September 30)	Water Quality	Microinvertebrates Chlorophyll A	Carbon Nutrients	Ecosystem metabolism	Larval fish	Riverine fish	Tadpoles, fish and turtles	Frogs	Waterbirds	Vegetation			
mid-Murrumbidgee	Gooragool	Full	✓	✓	✓				✓	✓	✓	✓			
	Mckennas	Full	✓	✓	✓				✓	✓	✓				
	Sunshower	Full	✓	✓	✓				✓	✓	✓				
	Yarradda	Full	✓	✓	✓				✓	✓	✓				
South Redbank	Mercedes	Full	NA	NA	NA				NA	NA	NA	NA	NA	NA	✓
	Two Bridges	Full	NA	NA	NA				NA	NA	NA	NA	NA	NA	✓
	Piggery Lake	Full	NA	NA	NA				NA	NA	NA	NA	NA	NA	✓
	Waugorah Lagoon	Full	NA	NA	NA				NA	NA	NA	NA	NA	NA	✓
Nimmie-Caira	Nap Nap	Unknown	NA	NA	NA				NA	NA	NA	NA	NA	NA	NA
	Avalon	Unknown	NA	NA	NA				NA	NA	NA	NA	NA	NA	NA
	Telephone	Unknown	NA	NA	NA				NA	NA	NA	NA	NA	NA	NA
	Eulimbah	Unknown	NA	NA	NA				NA	NA	NA	NA	NA	NA	NA
River sites	McKennis (Carrathool zone)		Commences October 2016						Oct16	Commences October 2016	Mar/Apr 2017				
	Bringagee (Carrathool zone)														
	Yarradda (Carrathool zone)														
	Narrandera (Narrandera zone)					Oct16									
	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>

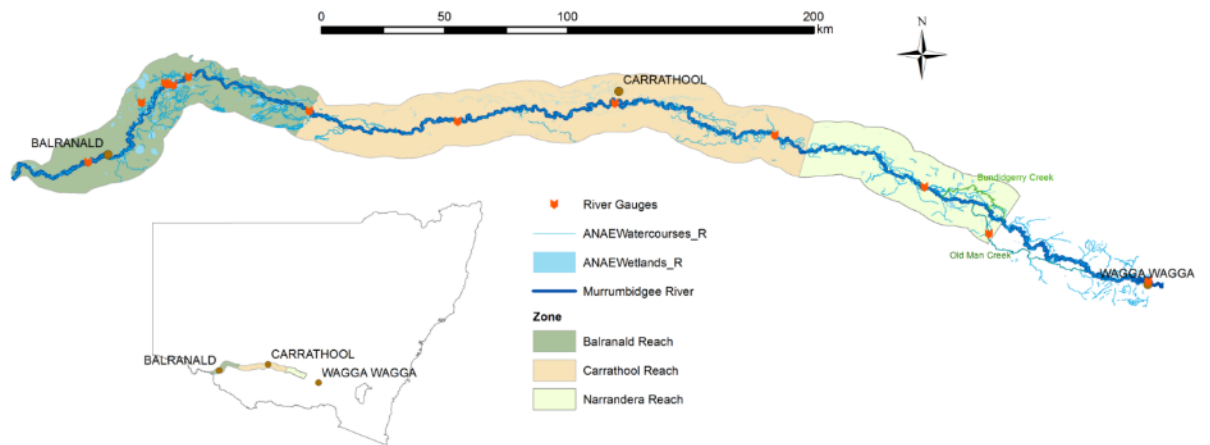


Figure 2 Distribution of riverine zones in the Murrumbidgee Selected Area.

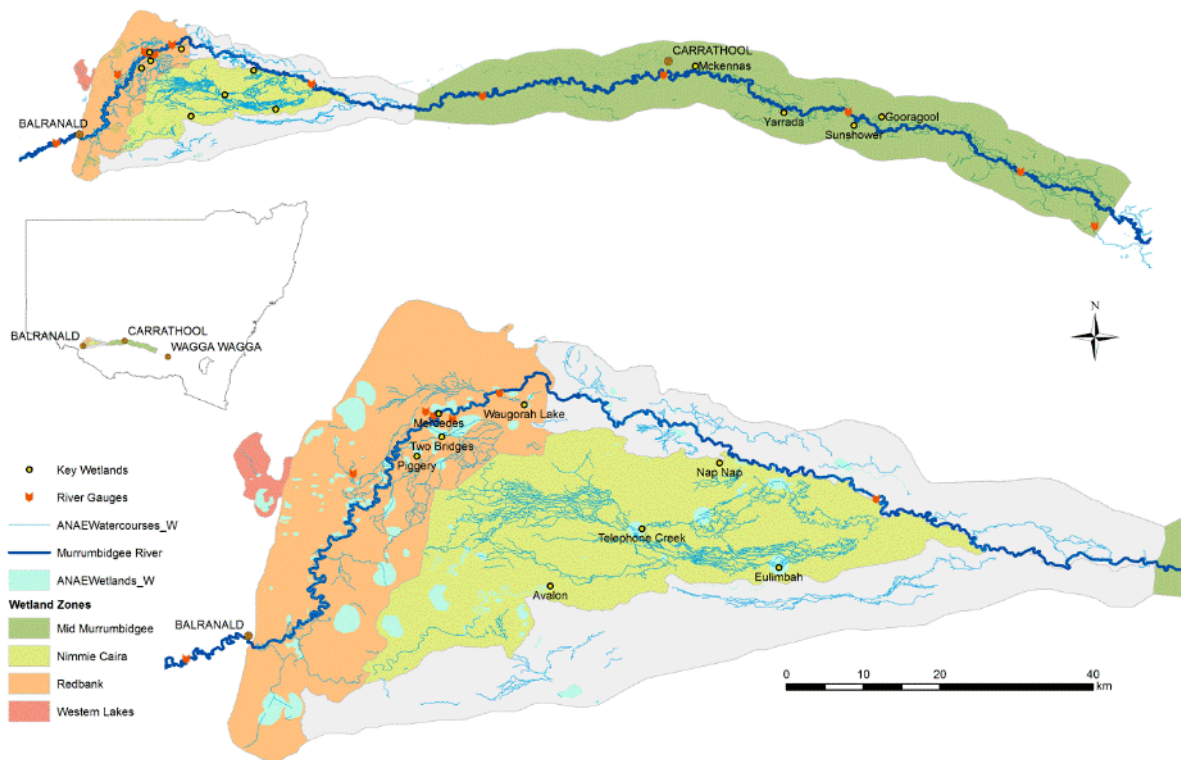


Figure 3 Distribution of wetland zones in the Murrumbidgee Selected Area and locations of key wetlands.