Australian Government
Commonwealth Environmental Water Office

Institute for Land, Water and Society
Charles Sturt University

Long Term Intervention Monitoring Project Murrumbidgee System Selected Area Project Progress Report #1 Report period: 1 July to 30 September 2014

Mercedes Swamp in Lowbidgee floodplain (Photo Wassens)

Wassens, S., Wolfenden, B., Spencer, J. (2014). Long term intervention monitoring project, Murrumbidgee System Selected Area, Progress Report number 1, September 2014. Charles Sturt University, Institute for Land, Water and Society. Prepared for the Commonwealth Environmental Water Office.

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Summary on progress against core monitoring and evaluation activities

Indicator Year 1	**Progress**
Ecosystem Type	Underway
Hydrology Cat 1	Depth loggers deployed 16th-20th September at the 12 LTIM wetlands
Stream Metabolism	Nutrient samples were collected and a D-opto dissolved oxygen logger was installed in the Carrathool reach on 17 September 2014 and will be serviced monthly for the next six months. Weather stations have been installed at Balranald, Carrathool and Narrandera to inform metabolism monitoring and provide climate information for other sampling associated with the LTIM Project.
Wetland nutrients	First of four annual sampling rounds undertaken between 23rd - 29th September 2014 samples currently being analysed
Microcrustaceans	First of four annual sampling rounds undertaken between 23rd Sept - 29th Sept In-channel monitoring of Microinvertebrates will commence in October 2014 in line with larval fish monitoring
Fish community (river)	Not yet scheduled, commencing April-May 2015
Fish recruitment	Not yet scheduled, commencing April-May 2015
Larval fish	Commencing 30th October 2014
Wetland fish, tadpoles and frogs	First of four annual sampling rounds undertaken between 23rd Sept - 29th Sept
Vegetation diversity	Fixed transects and photo points established at 12 wetlands. First of four sampling rounds undertaken between 23rd - 29th September 2014
Waterbird diversity	First of four sampling rounds undertaken between 23rd - 29th September 2014

Commonwealth environmental water use in the Murrumbidgee system as of September 2014

This report outlines the 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 June 2014 and September 2014. Monitoring includes intensive assessment of wetlands as outlined in the Murrumbidgee Monitoring and Evaluation Plan. Monitoring of in-channel fish responses is not scheduled until October 2014.

During this reporting period (June 2014-September 2014) no Commonwealth environmental watering actions had been untaken in the Murrumbidgee and a number of the LTIM Project wetlands were dry. This report describes conditions on the floodplain prior to environmental watering actions being undertaken. Environmental watering actions commenced to the North Redbank system and South Redbank systems of the Lowbidgee floodplain (see appendix 1) on the 23 September 2014. The key objectives of Commonwealth environmental watering actions were to support:

- native riparian, wetland and floodplain vegetation diversity and condition;
- maintain condition and provide reproduction opportunities for fish, waterbirds and other aquatic vertebrate species, and
- hydrological connectivity and water quality.

Commonwealth environmental water provided to the North Redbank system will also include return flows from the fringing wetlands to the Murrumbidgee River with the objectives of returning carbon and nutrients from the surrounding wetlands to the river in order to support primary productivity, microinvertebrate production which are important sources of food for larval fish and to release biota from wetlands. Dissolved oxygen monitoring of return flows will also be undertaken for hypoxic blackwater risk management.

Wetland monitoring

Routine monitoring of nutrients, water quality, microinvertebrates, fish, frogs, tadpoles, waterbirds (Cat 2) and vegetation diversity (Cat 2) was undertaken at the 12 LTIM Project wetland monitoring sites commencing (see appendix 1) on the 23rd of September 2014 (see appendix 2). Five of the 12 long-term monitoring sites were dry, while remaining wetlands largely contained residual water from 2013-14 environmental watering actions, local rainfall or leakage from nearby regulators.

In addition to routine sampling:

- Temperature and humidity data loggers were installed at each site.
- Depth loggers were established at the majority of sites, while installation at other sites requires additional works and will be completed before the onset of watering.
- Vegetation transects have been established and surveyed at all sites.

Field observations

Frogs

Southern bell frogs (*Litoria raniformis*, EPBC 1999) were observed and heard calling at Nap Nap and Eulimbah and Suicide swamp in the Nimmie-Caira zone. Southern bell frogs are actively calling at sites in Nimmie-Caira, particularly at Eulimbah. Given the recent history of inundation further watering of Eulimbah swamp is not a priority in 2014-15. However there are significant areas of lignum to the south and south- east of Eulimbah swamp (such as lignum around the south Eulimbah stock dam) that could be considered for environmental water with the aim of both improving lignum condition and aquatic diversity and providing summer refuge, foraging and breeding habitats for southern bell frogs. Rising flows through these areas in spring and maintaining inundation for approximately four months will provide recruitment opportunities for this species. These flows should be made a priority for October/November 2014.

Southern bell frog male calling from Eulimbah Swamp (September 2014) (Photo C. Amos)

Fish

Overall we recorded relatively low abundances of fish, with counts dominated by native carp gudgeon (*Hypseleotris* spp.). Few carp were captured compared with previous years, except for a large number of adult carp found in the dam-section of Avalon Swamp, in the Nimmie-Caira zone.

Setting large fyke nets at telephone Creek (Nimmie-Caria)

River red gum encroachment

River red gum encroachment is now a serious concern at the mid-Murrumbidgee LTIM Project sites (Mckennas, Yarrada and Gooragool lagoons) and is an emerging issue at Piggery Lake in the south Redbank system. Inundation is required to encourage natural thinning of seedlings and to maintain the open structure of these systems, in general inundation is most effective when the seedlings are small with far more intensive and prolonged inundation required once sapling trees establish.

River red gum encroachment McKenna's Lagoon (mid-Murrumbidgee)

Waterbird breeding

As spring environmental watering actions are yet to commence, waterbird abundance and diversity is relatively low throughout the Lowbidgee and mid-Murrumbidgee and there was no evidence of waterbird breeding activity at this stage. Further ground surveys of the LTIM Project sites and additional OEH complimentary monitoring sites are planned over October (20-24 Oct) to coincide with UNSW's long-term Eastern Australian Waterbird Survey being flown over the Lowbidgee on 21 October. These aerial and ground surveys will include an assessment of historical rookery sites in Yanga National Park and the Nimmie-Caira system. This information can be used to inform decisions around the delivery of environmental water over spring and summer to maintain water levels in rookery sites if nesting is detected.

Appendix 1 Maps showing location of hydrological zones and key wetlands in the Murrumbidgee system

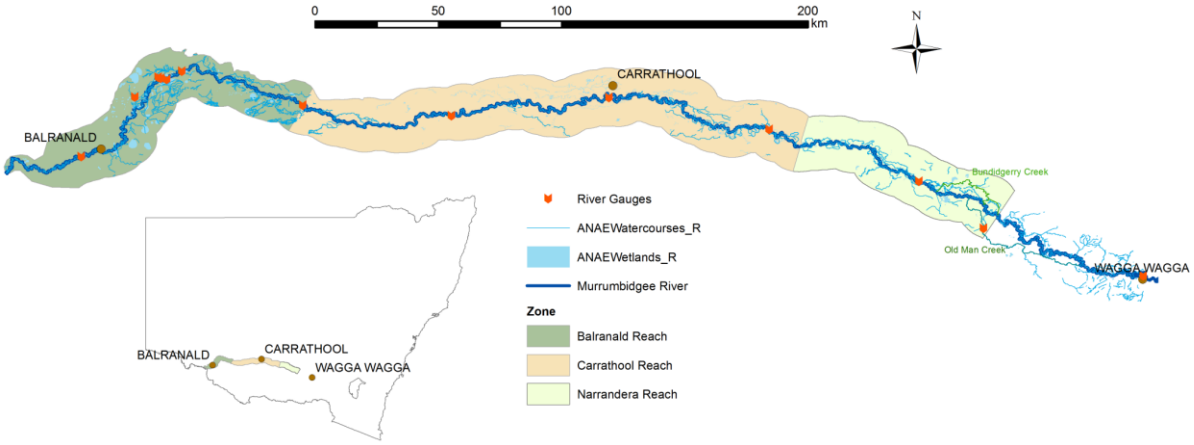

Figure 1 Distribution of riverine zones in the Murrumbidgee Selected Area.

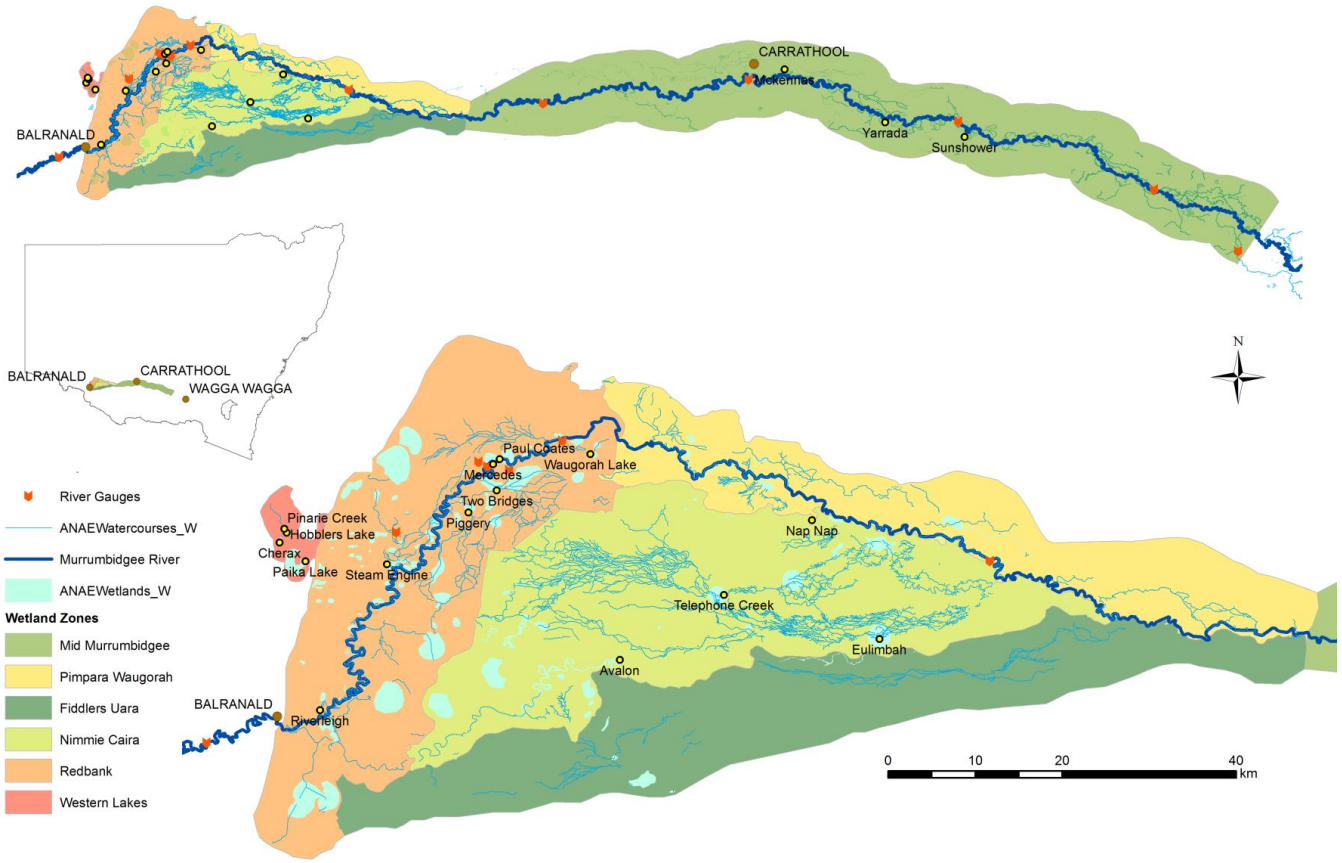

Figure 2 Distribution of wetland zones in the Murrumbidgee Selected Area and locations of key wetlands.

Appendix 2 Summary of monitoring activities undertaken between June and September 2014 as part of the Monitoring and evaluating ecological responses to Commonwealth environmental water use in the Murrumbidgee River Valley, in 2014-15.

Zone	Site name	Status	Water Quality	Microinvertebrates Chlorophyll A	Carbon Nutrients	Tadpoles, fish and turtles (wetlands)	Frogs	Waterbirds	Vegetation	Depth logger	Temperature logger
Wetlands											
mid-Murrumbidgee	Gooragool	Residual-drainage						✓	✓		✓
	Mckennas	Dry						✓	✓		✓
	Sunshower	Dry						✓	✓		✓
	Yarrada	Dry						✓	✓	✓	✓
South Redbank	Mercedes	Inundated (leakage)	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Two Bridges	Residual (2013-14)	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Piggery Lake	Dry	✓	✓	✓		✓	✓	✓	✓	✓
	Waugorah Lagoon	Recently inundated, levels declining	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nimmie-Caira	Nap Nap	Recently inundated, levels declining	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Avalon	Residual (2013-14)	✓	✓	✓	✓	✓	✓	✓		✓
	Telephone	Recently inundated, levels declining	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Eulimbah	Residual (2013-14)	✓	✓	✓	✓	✓	✓	✓	✓	✓
River sites											
River sites	River at Carrathool		✓	✓	✓						
	River at Maude		✓	✓	✓						
	River at Balranald		✓	✓	✓						
Return Flow	US Wynburn escape 1km *		✓	✓	✓						
	Immediately US Wynburn escape *		✓	✓	✓						
	Wynburn Wetland *		✓	✓	✓						
	DS Wynburn escape 1km *		✓	✓	✓						
	DS Wynburn escape 2km *		✓	✓	✓						
	DS Wynburn escape 3km *		✓	✓	✓						