JUNE 2020 ISSUE 4

THE BIDGEE BULLETIN

Quarterly Newsletter of the Murrumbidgee Monitoring Program

RESEARCH PROJECTS

This issue we feature two research projects developed by researchers from Charles Sturt University and partner organisations that explore the relationships between environmental watering actions and biodiversity responses in the Murrumbidgee region. The projects are a baseline vegetation assessment (benchmarking) project, and a study of the importance of artificial wetlands (such as farm dams) for frogs.

VEGETATION BENCHMARKING

Regular flooding is vital to maintain healthy river red gum forests and black box woodlands. Flood regimes determine the types of vegetation communities that grow in different wetlands. Permanent wetlands and those which regularly receive water are often characterised by large expanses of open water fringed by river red gum trees. Shallow wetlands that are seasonally inundated are often dominated by spike rush and the common reed. Wetlands that rarely become inundated, except during natural flood events, may experience dense river red gum regeneration that results in saplings encroaching on the wetland.

Welcome to Issue 4 of The Bidgee Bulletin. In this issue we highlight two of the research projects that operate in conjunction with the Murrumbidgee Monitoring, Evaluation and Research (MER) Program. We also check in with CSU PhD researcher Anna Turner and get an update on her work studying the prevalence of chytrid fungus in southern bell frogs in the lower Murrumbidgee region. And in this issues 'Who's Who in the Zoo' we feature Madeline Gorham, one of our colleagues from the Commonwealth Environmental Water Office.

The Bidgee Bulletin is a quarterly newsletter designed to provide updates on our progress as we monitor the ecological outcomes of Commonwealth environmental water flows in the Murrumbidgee Selected Area. The 2019-2022 program builds on the previous five year monitoring period (2014-2019) and uses many of the same methods.

From top: River red gum encroachment at McKenna's Lagoon in the mid-Murrumbidgee; barking marsh frog; Yanco billabong

Some wetlands in the mid-Murrumbidgee region such as McKenna's Lagoon have experienced high densities of river red gum recruitment, with trees growing throughout the wetland and resulting in a reduction in wetland health and function. CSU researchers are systematically benchmarking wetland vegetation diversity and structure to assess the health of wetland vegetation communities and the extent of red gum encroachment across the mid-Murrumbidgee and Lowbidgee regions. This information will help guide targeted delivery of environmental water which has been shown to maintain areas of open water and improve vegetation diversity.

FROGS IN FARM DAMS

The majority of frog species found along the Murrumbidgee River require slow-moving or still water to breed. As many natural wetlands no longer receive regular water, many frog species have declined and populations of the threatened southern bell frog are now dependent on environmental water or artificial wetlands such as irrigation channels and farm dams. During the spring and summer drought of 2019-2020, CSU researchers in partnership with YACTAC (Yanco Creek and Tributaries Advisory Council) surveyed frogs in 42 sites along Yanco Creek. Surveyed sites included both farm infrastructure (farm dams and irrigation channels) and natural wetlands such as billabongs and creeks. Preliminary findings from the surveys indicate that six frog species were calling and using these habitats, including ground-dwelling species such as the spotted marsh frog, barking marsh frog and plain's froglet; burrowing species such as the inland banjo frog; tree-dwelling species such as Peron's tree frog; and the southern bell frog. Many species were recorded from farm dams highlighting the value of this type of habitat as a refuge for frogs during times of drought.

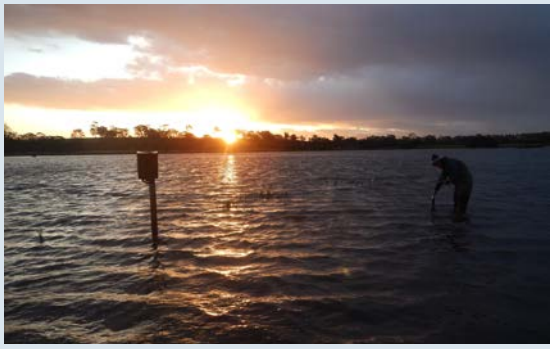
In March, the Murrumbidgee Environmental Water Advisory Group (EWAG) meeting took place in Leeton. The following morning participants visited several wetland sites including Gooragool Lagoon where CSU researcher Dr Damian Michael explained the use of artificial bark covers to survey for tree-dwelling reptiles and invertebrates.

The group is made up of community representatives, stakeholder groups and government departments. It provides a point of interface between the community and the Commonwealth and State governments and is an opportunity for high-level involvement in the management of water for the environment in the Murrumbidgee catchment.

Below: Grey snake (photo: Damian Michael).

Detection of the little known grey snake around Lowbidgee wetlands is the subject of a new journal article published recently in Australian Zoologist. The snake was observed and identified by MER Program researcher Dr Damian Michael during routine wetland monitoring activities over Summer 2018-19. This was the first confirmed sighting of this species south of the Murrumbidgee River, representing a southern range extension and confirmation that the species still persists in south-western NSW. Improved awareness of this small noctural snake has seen us detect more individuals at key Lowbidgee wetlands during 2019-20 field monitoring activities.

Find the article at: https://publications.rzsnsw.org.au/doi/10.7882/AZ.2020.008



From top: southern bell frog; Anna Turner collecting a skin swab; volunteer Matilda Terry measuring water quality; volunteer Chi Wei spotlighting for frogs in the lignum at Eulimbah Swamp.

IT'S NOT EASY, BEING GREEN

Charles Sturt University PhD student Anna Turner has been a frequent visitor to the wetlands of the Lowbidgee over the past couple of years. Since September 2018 she's spent hundreds of hours searching for populations of the threatened southern bell frog in the region. Anna's research is focused on amphibian chytrid fungus in southern bell frogs and the effect of environmental conditions, particularly temperature, on disease prevalence.

Her time in the field has involved capturing 1200 frogs, including over 500 southern bell frogs. She's been recording data including frog size, weight, body temperature, sex, activity, distance to water and location, and has collected skin swabs which are sent off to a laboratory to be analysed to determine if any of the tested frogs are infected with the chytrid fungus and if so, what level of infection they have.

Chytrid fungus is an aquatic fungus which lives on the frog's skin and consumes keratin in the skin cells causing a disease called chytridiomycosis. The disease affects the frogs' skin which can disrupt respiration and heart function, and eventually lead to cardiac arrest and death. Since its discovery in 1998, chytrid has been detected in more than 500 amphibian species and occurs in at least 52 different countries. In Australia, 62 out of 242 native frog species have been detected with the chytrid fungus. As the fungus is sensitive to temperature, the impacts on frog populations have largely occurred in cooler regions and at higher altitudes. Little study has been done outside the predicted temperature range of the fungus.

Last season (2018-19) Anna found low levels of chytrid infection in frogs swabbed from the lower Murrumbidgee region. There was low prevalence and low infection intensity, however it is present. This project is investigating how chytrid fungus is able to survive in these regions which are predicted to be outside its usual range due to environmental conditions. Anna has temperature loggers deployed in wetlands which have been measuring water surface temperature in a number of different vegetation types and depths. Using these loggers she hopes to map out the temperature regimes of the wetlands and gain a better understanding of where this fungus is able to persist and how timing of watering events may influence infection prevalence and mitigate its spread.

New Website Reveals Science Behind Environmental Flows

Murray-Darling Basin communities can now access the science behind environmental water with the launch of the new Flow-MER website. The website brings together the work of independent scientists from some of Australia's leading regional universities and research institutions on how Commonwealth environmental water is making a difference to the Basin's rivers, wetlands and floodplains. Monitoring, evaluation and research are central to how Commonwealth water is managed to improve the health of our rivers.

"The Flow-MER website is a great step towards improving transparency of our decision making. It offers people a way to engage with the scientists and see

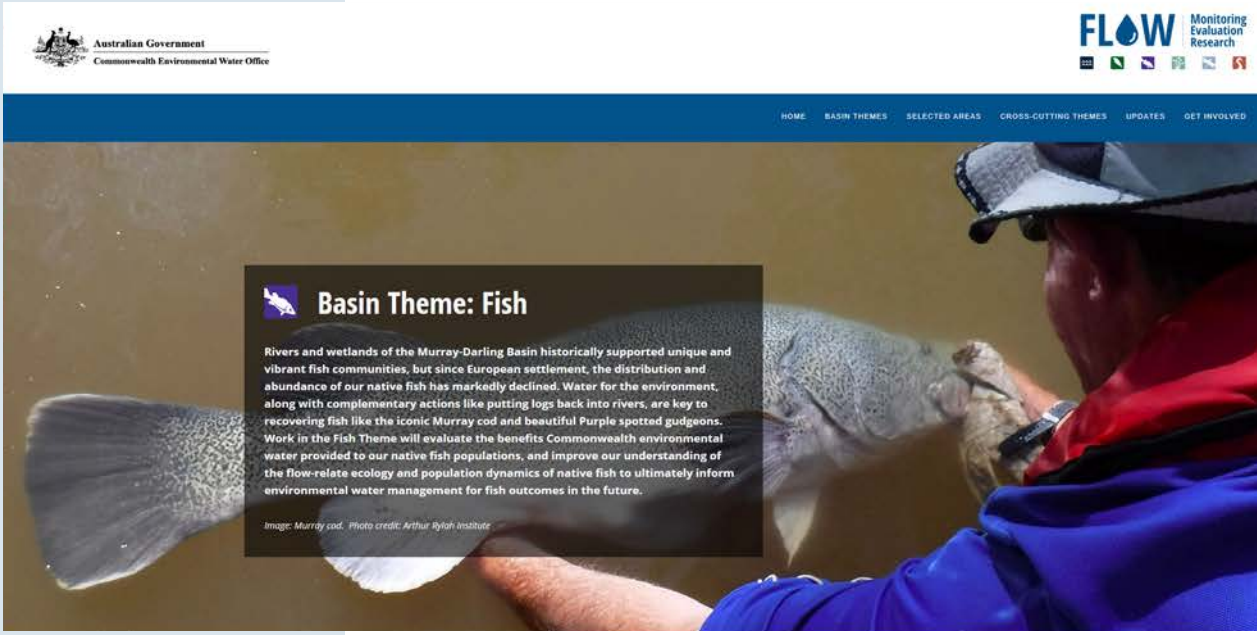
for themselves the thinking behind when and where we deliver water for the environment," said Jody Swirepik, Commonwealth Environmental Water Holder.

"Flow-MER builds on ten years of robust scientific monitoring and research that underpins our understanding of how plants and animals respond to water for the environment. By keeping decision makers abreast of the latest scientific findings, we can ensure that water for the environment is used in the best way possible to support fish, waterbirds, and wetlands," said Dr Carmel Pollino, Principal Research Scientist at CSIRO.

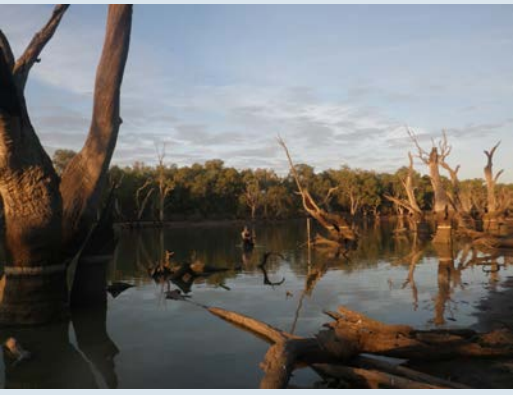
Numerous scientists work out in the field at locations across the Murray-Darling Basin, often with the involvement of Traditional Owners, local water managers and landholders.

"No matter where you live in the Basin, you can look at the Flow-MER website to find out where scientists are monitoring environmental flows near you. There are plenty of great photos and some terrific stories about the frogs and turtles that we meet when we are out in the field," said Skye Wassens, Principal Scientist, Charles Sturt University.

The Flow-MER website is now online. Visit flow-mer.com.au



Gayini Nimmie-Caira - return to traditional custodians



Gayini Nimmie-Caira, an 84,417 hectare property of internationally significant Murrumbidgee floodplain and wetlands, was offically handed back to its Traditional Custodians - the Nari Nari people, on 20th March 2020.

Originally purchased under an agreement between the Australian and New South Wales governments to contribute to achieving Murray-Darling Basin Plan outcomes, 19 separate properties were merged to form what is now known as Gayini Nimmie-Caira. Since May 2018 the property has been managed by a consortium led by The Nature Conservancy and including the Nari Nari Tribal Council, the Murray Darling Wetlands Working Group and the Centre for Ecosystem Science at the University of NSW.

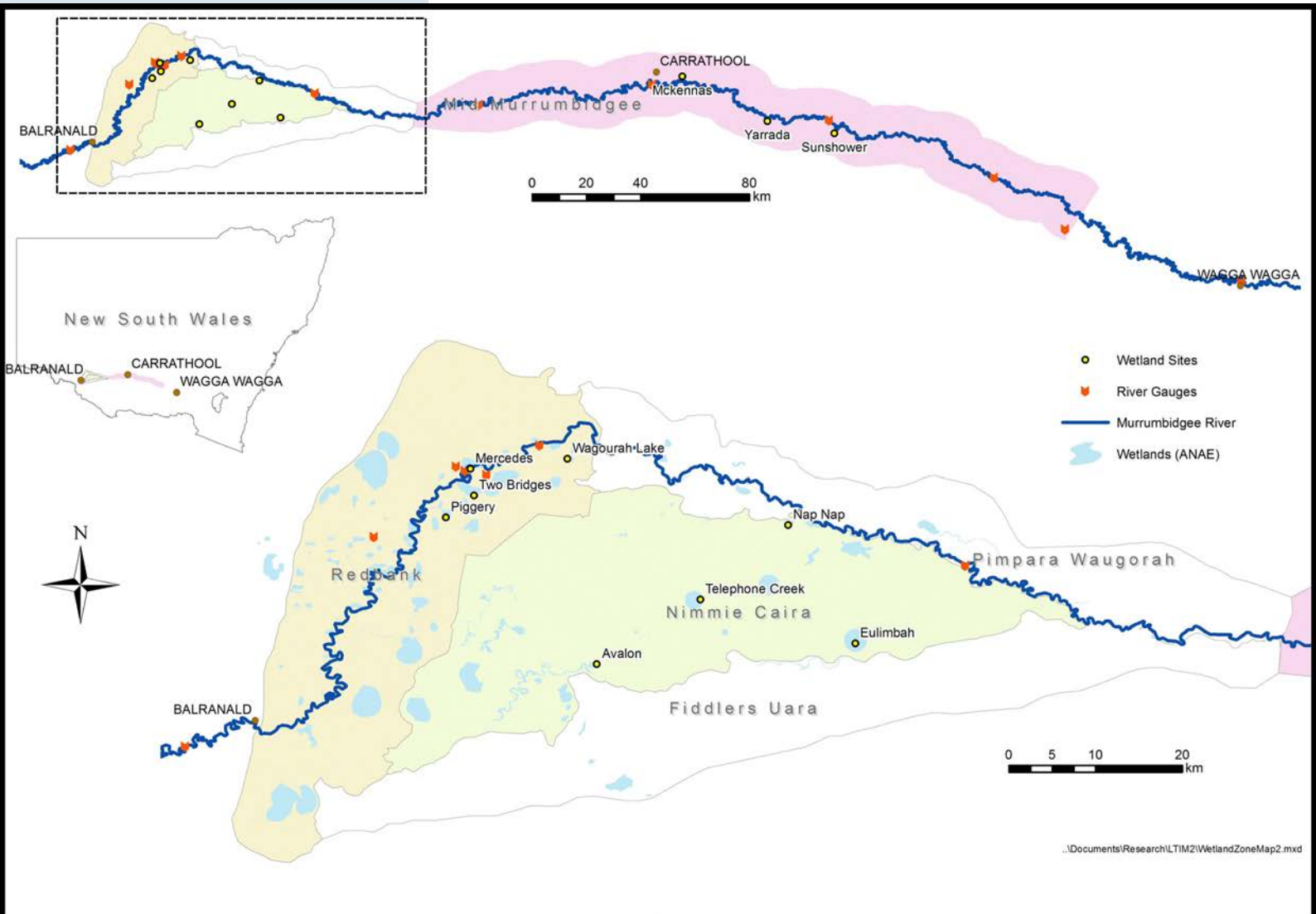
From top: Telephone Creek; kangaroo near Eulimbah Swamp; processing at Avalon Dam, Gayini Nimmie-Caira.

The property contains large areas of open lignum floodplain and floodways, and is home to a stunning variety of native Australian birds ranging from tiny spotted pardalotes to stately emus. When conditions are favourable extensive wetlands provide feeding and breeding habitat for many different species of waterbirds which can form large nesting colonies. The wetlands also support a range of threatened species including significant populations of the southern bell frog. It's part of the Lowbidgee floodplain, which is the largest area of intact wetlands remaining in the Murrumbidgee Valley and an area of national and international conservation significance.

Known as 'Gayini', the Nari Nari word for water, the area has been managed by its Traditional Custodians for over 50,000 years and is rich in Indigenous cultural sites, including scar trees, burial mounds and camp sites. Since being back managing Country, the Nari Nari are using a combination of traditional and modern methods to assess, protect and restore the landscape - removing feral animals, reinstating a natural inundation regime, identifying and protecting cultural sites and repairing infrastructure.

The director of The Nature Conservancy in Australia, Rich Gilmore, said: “Gayini is now legally owned by the Nari-Nari people, as it has been spiritually for 50,000 years". The property will continue to be managed for the protection and restoration of Indigenous culture and heritage, conservation values and sustainable economic development. The MER Program monitors several wetlands within Gayini Nimmie-Caira and welcomes the handover back to the Traditional Custodians.

Map showing monitored wetlands within the three Murrumbidgee zones: Redbank, Gayini Nimmie-Caira and the mid-Murrumbidgee.



WHO'S WHO IN THE ZOO?

This issue we find out a little more about one of our colleagues from the Commonwealth Environmental Water Office ...

Name: *Madeline Gorham*
Organisation: *Commonwealth Environmental Water Office*
Position: *Water manager*
I studied at: *Red Bend Catholic College in Forbes, then University of Canberra to study Landscape Architecture/Environmental Science, then later at Charles Sturt University for a Honours degree in Environmental Science & Management.*
In my previous jobs I: *wrote policy for the Basin Plan and then worked with landholders to achieve on-ground landcare initiatives*
Food attitude: *sweet*
Beverage of choice: *beer*
How would you describe your work to a child?
I help rivers run and the things that live in the river, like fish.
What's the best thing about your work?
variety
Your work in three words?
Water, Challenging, Political
Is your career your parents fault?
Yes probably. My Dad was a lucerne and sheep farmer on the Lachlan River and my Mum works as a water licenser.
It's now 2030, where are you?
Still working on the Bidgee
Flashback to 1999 – where were you then?
Bedgerabong Public School
Given the chance, who would you like to be for a day?
Annabel Crabb - an expert juggler
What's your favourite sign off?
Cheers

The Murrumbidgee MER team would like to acknowledge the consortium partners and local landholders with whom we work.

Australian Government
Commonwealth Environmental Water Office

FLOW Monitoring Evaluation Research

Charles Sturt University

We respectfully acknowledge the Wiradjuri, Nari Nari and Muthi Muthi peoples, traditional owners of the lands on which this publication is focused