

THE BIDGEE BULLETIN

Quarterly Newsletter of the Murrumbidgee Monitoring Program



THE YEAR IN REVIEW

Waterbirds

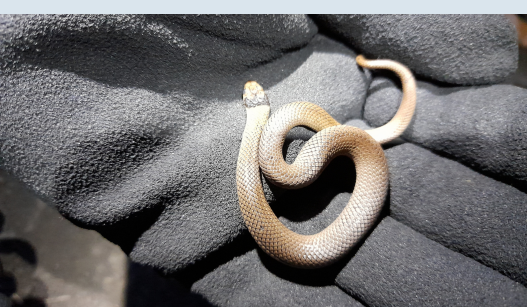
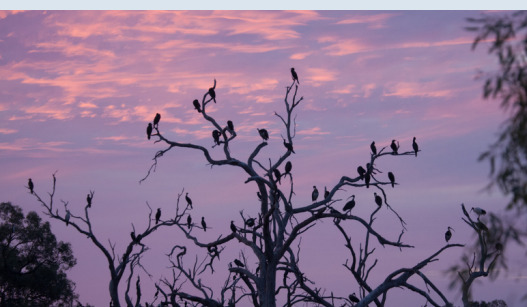
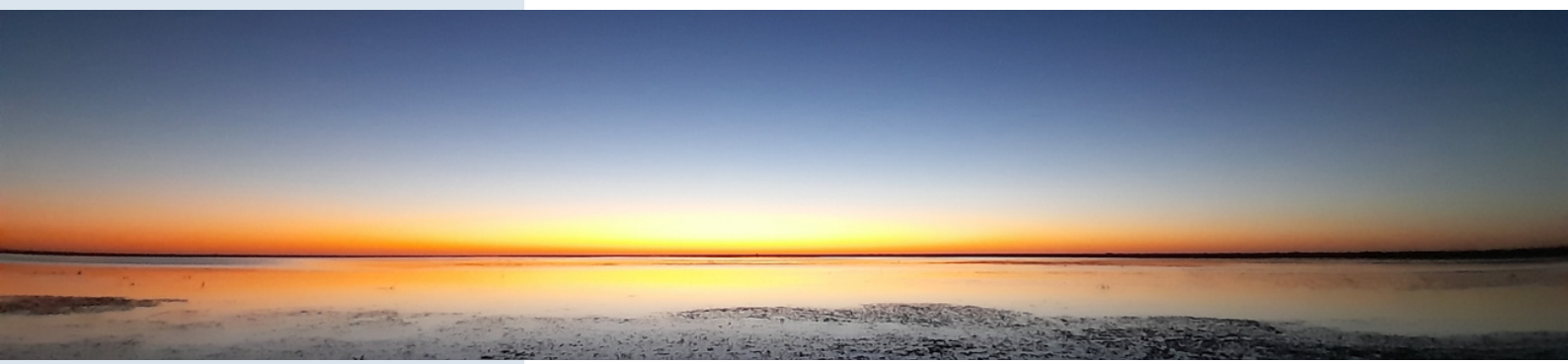
The highlight of the 2020-21 season was the spectacular waterbird breeding event at Eulimbah Swamp. More than 18,000 breeding pairs of straw-necked and glossy ibis took advantage of environmental water that filled the swamp in spring and settled into the lignum to lay eggs and raise chicks. The water level in the swamp was maintained throughout the event to maximise breeding success. Across our sites in the lowbidgee and mid-Murrumbidgee it was great to see significant numbers of breeding Australian white ibis; nankeen night herons; great and intermediate egrets; yellow-billed and royal spoonbills; great, little black and little pied cormorants; darters; swans; Eurasian coots; hoary-headed, great crested and Australasian grebes; and white-faced herons. Endangered Australasian bitterns were also heard booming at several sites and we've got our fingers crossed that they also had a successful season.

Vegetation

Compared to previous years, inundation with environmental water was deeper and lasted longer at

Welcome to Issue 7 of The Bidgee Bulletin. The monitoring season is now complete so in this issue we look back on some highlights from the 2020-21 water year. We also focus on some of the critters we regularly saw and give some insight into how plants play important roles in floodplain landscapes, regardless of size. Finally, we chat to Gilad Bino, who is a conservation biologist at the University of New South Wales.

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.



some of the monitored wetlands, topped up by rainfall late in the year. Consequently, we saw a strong response in wetland vegetation, particularly species that tolerate deep water such as common and red watermilfoil, common spike rush and floating pondweed. There was also growth of water primrose, nardoo, several starworts and new lignum at several sites. Early in the year we saw black box in poor condition at Avalon Dam but after the first almost complete inundation of the wetland since 2016 flowering trees were observed in January, which was a great result. Although McKennas Lagoon in the mid-Murrumbidgee remains dry, dense stands of Australian hollyhock were observed there for the first time. Australian hollyhock was also found at several other wetlands across the region.

Frogs

Frogs also responded well to the wet conditions. Call diversity was consistently high across the catchment and all six expected species were seen or heard during the surveys, including the endangered southern bell frog, which called in large choruses at several sites. We observed record numbers of tadpoles, including more than 1,700 individuals of *Limnodynastes* species in a single fyke net at Two Bridges Swamp. Recruitment success is yet to be determined but we expect it to be a good year—with some luck the tadpoles escaped the beaks of all the hungry waterbird fledglings.

Fish

Native fish catch in the wetlands was dominated by carp gudgeon, with smaller but consistent numbers of Australian smelt, flathead gudgeon and bony bream. We also caught several rainbow fish in the Lowbidgee lagoons and un-specked hardyheads were recorded at Coonancoocabil in the mid-Murrumbidgee. Notably, a 630-mm adult Murray cod was recorded at Waugorah Lagoon in September 2020 and a juvenile golden perch in Yarradda West Lagoon in March 2021. We had very high numbers of juvenile introduced carp and goldfish in Piggery Lake and Two Bridges Swamp in November but captures were greatly reduced by January, probably owing to the large numbers of birds in the region. Of some concern is the large increase in Oriental weatherloach numbers recorded at several sites, particularly Avalon Dam where over 300 individuals were recorded in a small fyke net. This introduced species was first recorded in Victoria in the 1980s and has since spread into the Murrumbidgee catchment.

Reptiles

Murray River short-necked turtles, eastern long-necked turtles and broad-shelled turtles of all age groups were recorded in low but consistent numbers across the region. At least one species was detected at almost every monitored site. Five more grey snakes were equipped with identification microchips at Nap Nap Swamp as part of the project investigating their abundance and distribution. Incidental sightings were made at Telephone Creek and on Loorica Road and grey snakes were also regularly observed out and about at night at Two Bridges Swamp—apparently we weren't the only ones surveying for frogs!

From top: sunrise in Gayini Nimmie-Caira; Murray-Darling rainbow fish; cormorants and ibis at Avalon Dam; we always have two furry volunteers helping us at Gooragool Lagoon; setting nets at Eulimbah Swamp; a juvenile grey snake.



Southern bell frog *Litoria raniformis*



Peron's tree frog *Litoria peronii*



Giant banjo frog *Limnodynastes interioris*



Either a barking marsh frog *Limnodynastes fletcheri* or a spotted marsh frog *Limnodynastes tasmaniensis* (the tadpoles are often too difficult to distinguish in the field)

The three turtle species at our sites: the Murray River short-necked turtle (top); eastern long-necked turtle (bottom left); and the broad-shelled turtle (bottom right)



KNOW YOUR TADPOLES

There are six species of spring-summer-calling frog that inhabit the mid-Murrumbidgee and lowbidgee wetlands. Monitoring frog populations is an important part of the MER program and relating information about frog presence and abundance with vegetation, water depth, water quality and weather gives us a great insight into how these native amphibians are taking advantage of environmental water flows. In the past, as soon as water has reached our sites the frogs have started to breed. At first, males begin calling at night in an effort to attract mates and soon after eggs are laid in a jelly-like mass. Tadpoles are voracious feeders and after hatching they can be seen swimming around during the day looking for food. Over a period of several weeks the fascinating process of metamorphosis occurs as these larvae slowly grow legs and resorb their tails. We often see frogs with tails out of the water and getting on with things as soon as they can!

We've monitored frogs since the beginning of the project and our surveys have two standard components: 1) we walk spotlighting transects at night and count the number of frogs we hear calling or see hopping around and 2) we catch tadpoles in fyke nets, sometimes in enormous numbers. In each case we identify them to species and measure the length of a subset to estimate their age.

Identifying slippery tadpoles is trickier than identifying frogs but there a number of features that can be used to help figure out who's who. These include the size, shape and colour of the whole tadpole, as well as the distance between the eyes or nostrils, mouth shape and position, tail musculature and shape, and the presence of stripes or spots. Noting down the developmental stage is also important because knowing whether they are simple swimmers or already hopping about will not only help with identification, but also give us a good idea about when the adults spawned and how many offspring are surviving.

MURRUMBIDGEE TURTLES

We regularly detect three species of turtle at our sites: the Murray River short-necked turtle *Emydura macquarii*, the eastern long-necked turtle *Chelodina longicollis* and the broad-shelled turtle *Chelodina expansa*. Turtles are long-lived and can occur in very high densities so they play import roles as consumers in aquatic food webs. Items on the menu for these three species include green algae, detritus and carrion, crustaceans, invertebrates, fish, insects and other organic material. Australian freshwater turtles spend most of their lives in the water, where they feed or bury themselves in the mud to wait out the winter. However, they are highly mobile and can travel large distance across the landscape between water bodies. They also lay clutches of about 25 eggs in holes dug on dry land where they are safe from inundation but unfortunately subject to destruction by foxes.





Above: a huge river red gum at Yarradda lagoon and a straw-necked ibis rests on a river red gum branch at Avalon Dam. Below: Anna Turner and Eva Moore waded through azolla at Nap Nap Swamp (photo Heremaia Titoko) and azolla ferns at Avalon Dam.



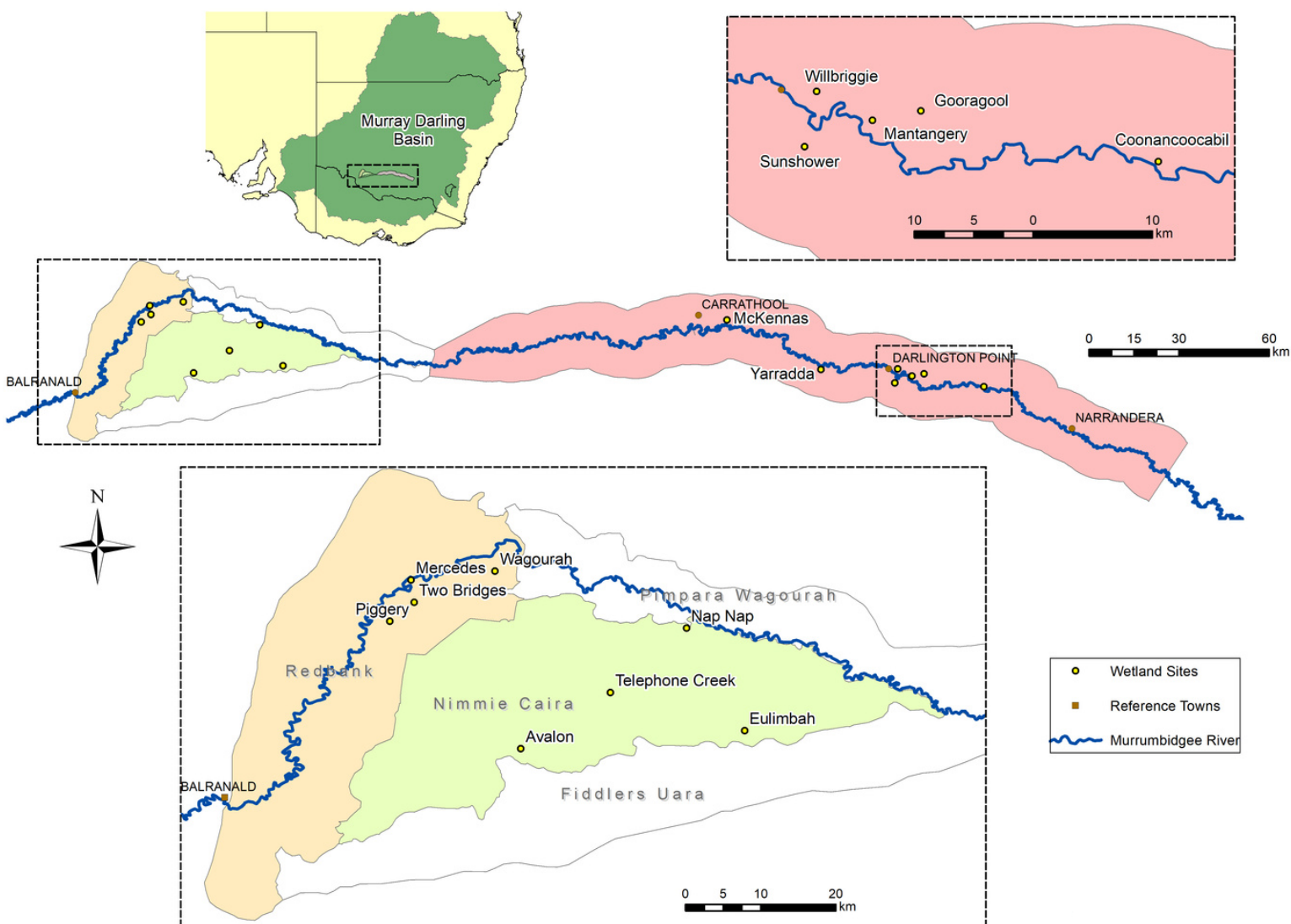
BIG VERSUS SMALL

Of all the plant species that we see in the wetlands we monitor, river red gums (*Eucalyptus camaldulensis*) and azolla (*Azolla filiculoides*) are most clearly at opposite ends of the size scale. However, both play impactful roles in riverine and floodplain communities.

River red gums are hard to miss—they are massive trees that tower over all other plant species in the Murrumbidgee catchment, often reaching 30 m in height. They like to get their feet wet, thriving in the moist clay soils of the floodplains, and can cope with seasonal inundation for months at a time when wetlands fill. They provide important habitat for birds, bats, arboreal mammals, lizards, snakes, frogs fish and insects, whether it's among their gnarled branches, within hollows, under exfoliating bark or beneath the root system. They also hold cultural importance for indigenous groups and a number of scarred trees that have been used for canoes or shields are visible in the Murray-Darling Basin.

Azolla are tiny, free-floating ferns that are less than three centimetres in diameter. Their simple roots don't touch soil and instead float beneath the surface of the water, drawing in nutrients directly from the water column. When conditions are good they can double their biomass in two days, spread out and form mats covering expanses of still or slow-moving water. This can be problematic if they reduce light needed by plants growing beneath the water surface and remove too much oxygen from the water column. Outside wetlands, azolla is used as a biofertiliser, in animal feed and can even remove heavy metals from water.

Map showing monitored wetlands within the three Murrumbidgee zones: Redbank (cream), Gayini Nimmie-Caira (light green) and the mid-Murrumbidgee (pink)



The next issue of The Bidgee Bulletin is out in late June 2021.

For more information or to join the newsletter mailing list please visit:
<https://www.csu.edu.au/research/ilws/research/environmental-water/murrumbidgee-mer>

We're on social media too!
Stay up to date with our adventures on Instagram and Twitter:

@BidgeeMER



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

WHO'S WHO IN THE ZOO?

This issue we find out a little more about the modeller extraordinaire of the MER project, Gilad Bino ...

Name: *Gilad Bino*

Organisation: *University of New South Wales and an adjunct at Charles Sturt University*

Position: *Senior Lecturer*

I studied at: *BSc and MSc at The Hebrew University of Jerusalem (Israel), PhD at UNSW*

In my previous job I: *Apart from travelling a bit around the world, I've been an ecologist at the Centre for Ecosystem Science since completing my PhD in 2011*

Food attitude: *I haven't touched a carbohydrate in over three years and never felt better*

Beverage of choice: *Yerba mate when the sun's up and single malt scotch under the stars*

How would you describe your work to a child? *A protector of animals and plants*

What's the best thing about your work? *To be with nature and having a sense of purpose*

Your work in three words? *Science, conservation, nature*

Is your career your parents fault? *My own*

It's now 2030, where are you? *In nature with loved ones*

Flashback to 1999 – where were you then? *In the army...*

Given the chance, who would you like to be for a day? *Myself with no work commitments*

What's your favourite sign off? *So long, and thanks for all the fish*

