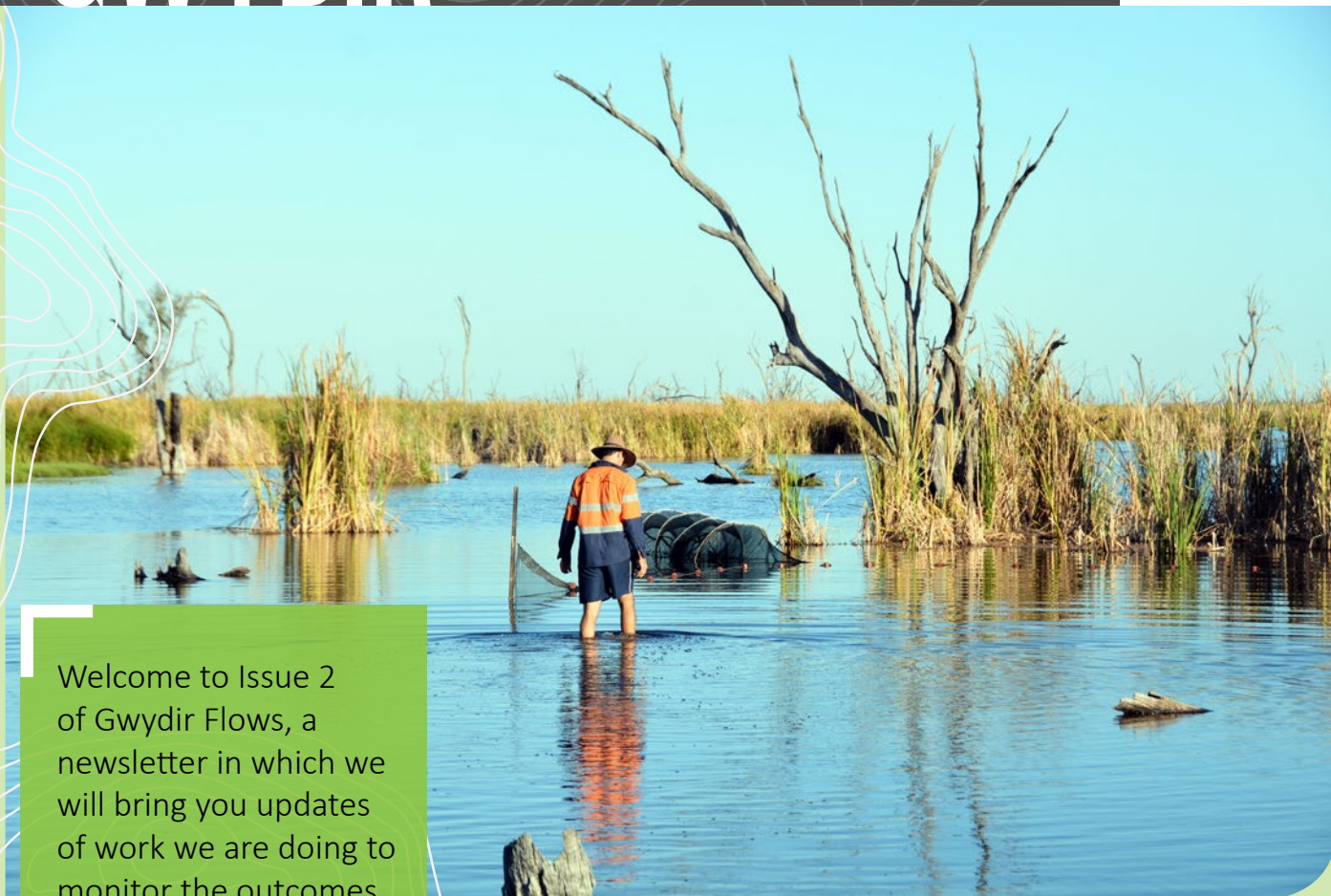


GWYDIR FLOWS



Welcome to Issue 2 of Gwydir Flows, a newsletter in which we will bring you updates of work we are doing to monitor the outcomes of Commonwealth environmental water management in the Gwydir Selected Area, as part of the Commonwealth Environmental Water Office's Long Term Intervention Monitoring (LTIM) Project. In this issue we would like to share outcomes from frogs and small fish monitoring.

In year 2 of the monitoring project we broadened our monitoring program to include frogs and small bodied fish in the wetlands to complement the broader fish monitoring occurring in the river channels. This will help us develop an understanding of the species that occur in the Gwydir wetlands and how they are affected by environmental flows.

We have surveyed twice so far, in early-December 2015 and mid-February 2016, at six sites, with differing flow regimes, levels of connectivity, and habitats using a combination of nets and visual surveys.



Spangled perch - Bunnor



Peron's tree frog (froglet) - Bunnor

A total of eight fish species and six frog species were recorded in the Gwydir and Gingham wetlands.



Native fish

During the two surveys six native fish species were recorded, western carp gudgeon, spangled perch, bony bream, eel-tailed catfish, fly-speckled hardyhead, and olive perchlet. High rainfall between survey periods, coupled with environmental flows, is likely to have allowed spangled perch to spread via overland flow to more western parts of the Gwydir Wetlands. Native species diversity and abundance was higher after the rainfall and flow event while the abundance of exotic species, (gambusia in particular) was substantially lower. Native species diversity may have increased due to inundation providing a fresh flush of water, stimulating fish breeding.

The capture of olive perchlet is exciting; once widespread through the Murray-Darling, this small native fish is now found only at a few sites, including in the upper Darling Basin. Because of their decline the western NSW population of the olive perchlet is now listed as an Endangered Population, so finding them in the lower Gwydir system is encouraging. A small number of olive perchlet were observed in the Lower Gingham watercourse in 2013, and since then, they have not been recorded in the system until now. It is thought that these fish may have moved into the lower Gingham from the Border Rivers channels in the large flood of 2011-12. It was exciting to catch about 50 of these fish during a community field day hosted by North West Local Land Services (NWLLS) and Office of Environment and Heritage (OEH) with a crowd of kids and other community members looking on.

Species profile:

Olive perchlet have an oval shaped body with a moderately large mouth, very large eyes and a forked tail. Their scales are generally clear and because of this they are usually semi-transparent. They grow to about 70 – 80 mm, although more commonly are less than 40 mm. They inhabit sheltered areas of rivers, creeks, ponds and swamps and feed at night on a range of zooplankton and aquatic and terrestrial insects. Predation by gambusia and redfin perch has led to their decline, as has habitat degradation, river regulation, spawning failures due to cold water releases from dams, and loss of instream vegetation. Allocation of environmental flows to restore seasonal flow patterns, and reinstating wetting and drying cycles in wetlands to improve wetland health are both considered an effective means of conservation and recovery of this species.

Exotic fish

Of the eight species of fish we captured two were exotic – gambusia and carp. These were quite widespread throughout the wetlands during the first round of sampling. While they were present during the second round of sampling (after the inundation), they were fewer in number. There are a couple of reasons why this might be the case; inundation may have pushed them into the fringes of the wetlands, away from where the fyke nets were set up; and/or they may have been predated upon by the spangled perch.



Species Profile:

Gambusia, a small freshwater fish introduced from south-eastern USA, is now common throughout most parts of Australia. Introduced to control mosquitoes, they have proven to be no more effective than small native fish. They are hardy, rapid breeders that compete for food and resources with native species. They behave aggressively towards and prey upon the eggs and juveniles of other species. They are also known to predate on tadpoles and adult frogs, resulting in the decline of frog species. Management of water quality, environmental flows, fish passage and snags helps to create conditions that are less favourable to gambusia and more favourable to native fish.

Carp and the herpes virus:

European carp is a wide-spread and hardy pest that adversely affects the health of wetlands and rivers. Their spread is difficult to control; however, the carp herpesvirus is being investigated by the CSIRO to see if it has the potential to substantially reduce carp numbers. Further testing will be done to ensure the virus will not harm native species once it is released; however, early results are promising. A strategy will be developed by the federal government to identify the right time and right sites for release. The target for the release of the virus is within the 2017-2019 period.



Frogs

We recorded six species of frog during our surveys; eastern sign-bearing froglet, barking marsh frog, spotted marsh frog, broad-palmed rocket frog, Peron's tree frog, and striped burrowing frog.

Frog communities appeared responsive to rainfall events and an increase in water through the landscape, dispersing from waterholes opportunistically to occupy puddles and other wetted areas. Frog numbers were lower in February than December, giving the appearance at some survey sites that overall numbers had declined. However, it is likely that heavy rainfall in late January created a landscape covered with a mosaic of shallow, vegetation-laden waterholes and puddles; allowing frogs to disperse from waterholes, at which they had been concentrated during dry periods.

Species profile:

The **broad-palmed rocket frog** is common in NSW and found in a broad range of habitats, from high elevations of the tablelands to semi-arid plains. This species is ground-dwelling, sheltering under logs and litter; and breeding in streams, wetlands, dams and ephemeral ponds.



Other critters

Our sampling techniques mean that we sometimes trap other vertebrates in addition to those that we are targeting. This information is useful to gain an understanding of broader diversity within the wetlands. Other species we came across included; a water rat, eastern long-necked turtles, Murray turtles and broad-shelled turtles.

Left is a juvenile broad-shelled turtle. This species is widespread in the Murray-Darling Basin, preferring large permanent water bodies. They ambush fish and shrimp from their hiding places in submerged debris and roots.

Quirky fact: When handled the broad-shelled turtle exudes a smelly secretion that helps to repel predators.

Useful links for more information: <http://www.dpi.nsw.gov.au/content/fisheries/info/nsw-fish-species>
<http://www.mdba.gov.au/discover-basin/environment/animals>
<https://blog.csiro.au/reclaiming-our-rivers-from-feral-carp/>

This project is part of the Commonwealth Environmental Water Office's \$30m Long Term Intervention Monitoring (LTIM) Project. The LTIM Project aims to monitor the ecological outcomes of Commonwealth environmental water use at seven areas across the Murray-Darling Basin, to evaluate the contribution of environmental water to achieving the objectives of the Murray Darling Basin Plan. Further information about the LTIM Project is available at: <https://www.environment.gov.au/water/cewo>

Peter Hancock

SENIOR AQUATIC AND GROUNDWATER ECOLOGIST



Describe your role:

I assess the impacts of environmental water on frog and small fish communities.

What does a regular day on the LTIM Project look like?

Checking the fyke nets around dawn is always the most exciting time, because you never know what will be in the nets. Fyke nets resemble tunnels that have two net walls leading fish and other animals like turtles into a one-way conical holding area, which is set slightly above the water so that animals that need to come up to breathe can do so. We also use a seine net to drag for fish near the shore. All native animals are released unharmed. We generally have the fish sampling finished by mid-morning and have the middle part of the day to relax.

After dinner we head out again to set fyke nets at the next lot of sites and then start our frog surveys once it's dark. These involve a visual survey, where we search the water's edge and surrounding vegetation and marsh, and count the frogs that we see, and a period of listening to see what species we hear. We often don't return to our accommodation until after 11:00 pm.

What's your most memorable LTIM Project moment so far?

The best thing about the LTIM project is the camaraderie that develops in the field. I also enjoy being part of a larger, multi-discipline team, working with people outside of my immediate area of expertise.

My most memorable moment so far happened on our February field trip. During the previous survey, one of our sites at Old Dromana had very few fish in it. However, rain and a flow event in late January meant that this waterhole became connected to other parts of the wetland. This connection allowed more than 600 spangled perch, and other fish species, to move into the waterhole. This is an excellent example of what environmental flows can help achieve.

What do you wish other people knew about the LTIM Project?

That environmental water actually appears to be helping some components of the ecosystem.

Jen Spencer

SENIOR SCIENTIST



Describe your role:

I work as a Senior Scientist for the NSW Office of Environment and Heritage. We work on waterbird and other wetland-

dependent fauna monitoring projects in the Gwydir and across the state to determine the ecological outcomes of environmental water management. We have been undertaking field surveys to count the diversity and abundance of waterbirds in the Gwydir Wetlands since 2007 and using the results of our surveys to inform the planning and management of environmental water.

What does a regular day on the LTIM Project look like?

The Gwydir LTIM program has provided additional resources allowing the NSW OEH survey program to expand the number of sites where we survey waterbirds in the Gwydir Wetlands. We have been working collaboratively with the Ecological team since 2014 which has included week long surveys twice a year in spring and autumn, and communication throughout the year to report on the outcomes of the joint surveys.

What's your most memorable LTIM Project moment so far?

In our most recent spring waterbird surveys, I saw Latham's snipe (also known as Japanese snipe) feeding along the muddy edge of a flooded wetland in the Lower Gwydir. This extremely well camouflaged waterbird species is usually very difficult to see unless they are flushed from underfoot as you walk through a wetland. These special birds breed in Japan and travel to Australia to feed in our freshwater wetlands during their northern hemisphere winter.

What do you wish other people knew about the LTIM Project?

The Commonwealth Environmental Water Office have committed five years of funding to seven selected areas in the Murray-Darling Basin including the Gwydir Wetlands to determine the outcomes of environmental water use. This long term government commitment for ecological monitoring and research is somewhat unusual but is critical for informing the effective planning and management of environmental water.