

Environmental water benefits wetlands and threatened species

Environmental water creates a hive of activity at wetland dam

Melissa Pouliot, for Wimmera Catchment Management Authority

Watchem farmer Mary Fielding's remote property which borders the Wimmera, Mallee and North-Central Victorian catchments is usually a fairly quiet and peaceful part of the world. But since December 2014, when water from the Wimmera Mallee Pipeline started flowing into one of her wetland dams, 'Newlands' has become a hive of activity.

Mary, whose family settled in the district in 1868, says she needed a traffic policeman at the gate for the number of neighbours driving in to witness the historic occasion. Not to mention the animals who are now frequenting the area.

The water is part of Victorian Environmental Water Holder's 1000 megalitre wetland entitlement that

provides water via a pipeline to a number of wetlands in the three Catchment Management Authority (CMA) areas. Before water started flowing into her dam, Mary made the dam smaller to improve water storage, and landscaped around the edge with old logs to make it more environmentally friendly. She also put logs in the centre so birds could seek refuge from foxes or cats.



*Australian wood ducks (*Chenonetta jubata*) (foreground) and a grey teal (*Anas gracilis*) are among a long list of visitors to Mary's wetland dam, which has received environmental water from the Wimmera Mallee Pipeline wetland allocation* (© Copyright, Greg Fletcher)



*A white-faced heron (*Egretta novaehollandiae*) comes in to feed on frogs and invertebrates at the wetland dam on the property of Mary Fielding in Victoria's Wimmera Mallee* (© Copyright, Greg Fletcher)

“First the kangaroos and wallabies arrived,” Mary says. “Then came various birds like bluebonnets (*Northiella haematogaster*), red-rumped parrots (*Psephotus haematonotus*) and eastern rosellas (*Platycercus eximius*), plus crows, magpies, water birds, white-faced herons (*Egretta novaehollandiae*) and ducks. We’ve also got remote sensor images of the goannas coming down to drink.”

From the air, all you see is large cleared farming land with a few stands of trees here and there. But when you look more closely, as wetland consultant Damien Cook did, you’ll be amazed at the diversity of plants and animals who call this place home.

Wimmera CMA asked Damien to survey 13 sites connected to the pipeline to help them understand their environmental values and environmental water requirements. Damien surveyed Mary’s dam, describing it as having some plants of very high conservation significance. The most obvious find was an old black box (*Eucalyptus largiflorens*) with a girth of six metres and culturally significant scarring. Mary calls this the Magic Faraway Tree, and as a child she and her siblings would pretend they were part of the popular Enid Blyton story.

Damien also found three plants listed as rare or threatened in Victoria – buloke mistletoe (*Amyema linophylla* subsp. *Orientalis*), dwarf brooklime (*Gratiola pumilo*) and inland club-sedge (*Isolepis australiensis*). They also found seven bird species, including the threatened brown treecreeper (*Climacteris picumnus*).

Wimmera CMA chief executive David Brennan said stories like Mary’s and Damien’s research were critical in understanding the value of environmental water releases to wetlands, creeks and rivers.

The community is encouraged to contact Wimmera CMA with their observations to include in Environmental Watering Management Plans. Please contact 03 5382 1544, fill out a survey online at www.wcma.vic.gov.au or post comments on the CMA’s Facebook page www.facebook.com/WimmeraCMA



This black box (*Eucalyptus largiflorens*) with culturally significant scarring sits on the banks of Mary Fielding’s wetland dam. As children, Mary and her siblings referred to it as the Magic Faraway Tree (© Copyright, Greg Fletcher)

Prioritising for native fish in the Murray-Darling Basin

Commonwealth Environmental Water Office

Environmental watering in a number of catchments in the Northern part of the Murray-Darling Basin is proving beneficial for native fish.

The Commonwealth Environmental Water Office (CEWO) works closely with its delivery partners to deliver Annual Basin Priorities. CEWO, the New South Wales Office of Environment and Heritage, and New South Wales Department of Primary Industries undertook environmental watering in a number of catchments in the Northern part of the Murray-Darling Basin with the specific objective of supporting the survival and enhancement of native fish populations.

In late August 2014, five gigalitres of Commonwealth environmental water from tributary inflows downstream of Wyangala dam was protected from regulation, and allowed to flow the length of the Lachlan system. This approach preserves the chemical signatures and carbon/nutrient profiles contained by overland run-off in flow from unregulated tributaries, and provides cues for native fish movement and breeding. Preliminary sampling indicates that a number of native species spawned after the event, including Murray cod (*Maccullochella peelii*), Australian smelt (*Retropinna semoni*), freshwater (or eel-tailed) catfish (*Tandanus tandanus*) and carp gudgeon (*Hypseleotris sp.*).

In May 2014, a cold water pollution curtain was installed in Burrendong Dam. The curtain aims to minimise the release of cold water from the bottom of the dam and is anticipated to improve native fish habitat within the river immediately below the dam.

Whilst native fish breeding in response to water temperature is very well documented, how native fish respond to river flow to stimulate and support breeding and movement activity is less well understood.

In order to create favourable opportunities and better outcomes for native fish in the Macquarie River, 10 gigalitres of Commonwealth environmental water and 18.5 gigalitres of New South Wales environmental water was delivered in early October through to December 2014. Fish sampling before and after indicated the presence of both state and nationally listed threatened species, including the eel-tailed catfish, silver perch (*Bidyanus bidyanus*), trout cod (*Maccullochella macquariensis*) and Murray cod. All large-bodied fish were measured, weighed and any conditions or parasites were noted, and the fish were returned, unharmed, to the river. Additionally, larval and juvenile fish were collected for otolith (ear bone) ‘back-dating’, to determine the timing of their hatching in relation to the flow event. This is a painstaking process and it is early days yet, but stay tuned to see what the analysis reveals!

For further information on the Commonwealth Environmental Water Office, please visit:
<http://www.environment.gov.au/water/cewo>



*Sam Davis and Jerom Stocks from Fisheries NSW wrangling an adult Murray cod (*Maccullochella peelii*) in Dubbo, March 2015* (© Copyright, Sam Davis, Fisheries NSW)



*Juvenile eel-tailed catfish (*Tandanus tandanus*) sampled in the Macquarie River* (© Copyright, Jerom Stocks)



*Daily aged otolith (ear bone) of a 20 millimetre Australian smelt (*Retropinna semoni*), aged at 63 days* (© Copyright, Jerom Stocks)

Environmental water safeguards threatened frog

New South Wales Office of Environment and Heritage, and the Institute for Land, Water and Society, Charles Sturt University

Southern bell frogs benefit from environmental water being used to improve wetland health in south-western New South Wales.

The southern bell frog (*Litoria raniformis*) (also known as the growling grass frog) was once widespread across south-eastern Australia. However, altered flow regimes, prolonged periods of drought, loss of habitat and pressure from introduced fish have contributed to a significant decline in the species. Today, southern bell frogs are locally extinct in many of their former strongholds in the Lachlan, Murrumbidgee and Murray River catchments. The species is now listed as nationally vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*, red-listed by the International Union for Conservation of Nature and recognised under State threatened species legislation (NSW, SA, Victoria and Tasmania).

Over the eight years to 2015, the NSW Office of Environment and Heritage has managed environmental water on behalf of the NSW Government and in partnership with the Commonwealth Environmental Water Holder to restore and maintain habitat for wetland-dependant fauna, including the southern bell frog. This began in the later stages of the millennium drought when systematic surveys showed that southern bell frogs were persisting in a small number of river red gum and lignum-black box wetlands. After widespread flooding in the southern Murray-Darling Basin between 2010 and 2012, a small number of bell frogs re-populated many of their former wetland sites. Subsequent multi-year environmental flows also saw southern bell frogs re-appear further afield in several

targeted wetlands throughout the Murrumbidgee and Murray River valleys. To date, over 31 gigalitres of environmental water has been directed to 22 bell frog sites in the Lachlan, Murrumbidgee and Murray River valleys to support bell frogs and other wetland-dependent fauna.

The southern bell frog is found in permanent and seasonally-flooded wetlands. They are sensitive to prolonged drying of their wetland habitat and availability of aquatic vegetation for breeding. Maintaining refuges during droughts and timing wetland flooding to coincide with bell frog peak breeding activity in spring and summer are critical factors for aiding the recovery of this species.

The fate of the southern bell frog in inland NSW will be determined by the availability of environmental water to flood sites where they are known to occur and our ability to protect the species from additional pressures such as introduced fish. New South Wales and Commonwealth funded monitoring to date has been crucial for determining the presence of bell frogs and evidence of breeding, including egg masses, tadpoles and juvenile frogs, to inform the timing and duration of follow-up watering actions across the frog's range.

For further information, please visit:
<http://www.environment.nsw.gov.au/environmentalwater/index.htm>



*A Southern bell frog (*Litoria raniformis*) with a green and gold warty back, and visible pale green mid-dorsal stripe*
 (© Copyright, Joanne Ocock, NSW Office of Environment and Heritage)



*A key southern bell frog (*Litoria raniformis*) site in the Lowbidgee Floodplain - Two bridges swamp, Yanga National Park* (© Copyright, James Maguire, NSW Office of Environment and Heritage)



*A key southern bell frog (*Litoria raniformis*) site on private land in the mid-Murray – Murray Downs*
 (© Copyright, Emma Wilson, NSW Office of Environment and Heritage)

Finding a new wetland home for a threatened fish in the Murray-Darling Basin

The Murray-Darling Freshwater Research Centre

Research, land and water management agencies and state government department's work together to provide a new wetland home for the threatened Murray hardyhead (*Craterocephalus fluviatilis*).

The Murray hardyhead is a small fish native to the wetlands of the lower Murray River system, which for the last few decades has faced a very real threat of extinction. As few as nine remnant populations survive in Victoria and South Australia, all of which required a helping hand to avoid extinction during the recent millennium drought.

A revised draft Recovery Plan for the species identified two key recovery objectives for the species:

1. Protect, maintain and monitor known populations, and
2. Increase the area of occupancy of the species. One method to achieve this is to translocate fish from existing populations to carefully selected and prepared floodplain wetlands, from which natural dispersal will be possible in future flood events.

Monitoring by the South Australian Department of Environment, Water and Natural Resources (DEWNR) of Riverland populations of Murray hardyhead in February 2015 identified high abundances in two wetland systems: Dishers Creek and Berri disposal basin. These high abundances were likely a reflection of recent conservation efforts by DEWNR, involving carefully timed delivery of environmental water supplied by the Commonwealth Environmental Water Office (CEWO). This presented an ideal opportunity to progress Objective 2 of the Recovery Plan by translocating a sub-population of Murray hardyhead from the Riverland sites to another suitably prepared wetland.

Fortunately, a long collaboration between the Murray-Darling Freshwater Research Centre (MDFRC), the Mallee Catchment Management Authority (MCMA) and Victorian Department of Environment, Land,



Murray hardyhead (Craterocephalus fluviatilis) is a small native fish found in the lower Murray River system

(© Copyright, Iain Ellis)



Lara Suitor (SA DEWNR) and Iain Ellis (MDFRC) netting Murray hardyhead (Craterocephalus fluviatilis) in a Riverland wetland (© Copyright, Scott Huntley)

Water and Planning (DELWP), has developed translocation sites including Brickworks Billabong in Victoria, a wetland just a few hundred kilometres from the Riverland. Water from the Commonwealth and Victorian Environmental Water holders has been delivered to Brickworks Billabong since 2013 specifically to establish suitable habitat for Murray hardyhead.

Both Victorian and South Australian state departments were able to fast track approval for the translocation of Murray hardyhead. Meanwhile, the MCMA and CEWO concurrently delivered environmental water to Brickworks Billabong in order to increase available habitat, and prompt a production boom in the wetland, enhancing food supply in readiness for the addition of Murray hardyhead.

The MDFRC and DEWNR then captured and translocated a sub-population of Murray hardyhead (approximately 2500) from the Riverland to Brickworks Billabong in a transport trailer generously supplied by the Victorian DELWP. Future monitoring

of Brickworks Billabong will evaluate the success of survival and recruitment following the translocation, with all parties keen to see a thriving new population in the Mallee.

We believe this is the first coordinated interstate translocation of threatened fish between South Australia and Victoria. This recovery action was only possible due to large-scale cooperation and collaboration involving research, land and water management agencies and state government departments. Cooperation is paving a path for the streamlining of threatened freshwater fish recovery processes.

For more information, please visit:

<http://www.mdfrc.org.au/projects/featured/MHHtranslocation.asp>, or read the 2014 review of the status of Murray hardyhead: <http://www.mdfrc.org.au/projects/featured/Mhhworkshop.asp>



Some of the Riverland catch of Murray hardyhead (Craterocephalus fluviatilis) in March 2015 (© Copyright, Scott Huntley)