Waterbirds and environmental water

Waders in the wetlands

Commonwealth Environmental Water Office

The Macquarie Marshes, located in the heart of the Murray-Darling Basin, is an internationally listed Ramsar wetland and one of Australia's most significant waterbird breeding areas.

At the end of May 2014, staff from the Commonwealth Environmental Water Office visited the Macquarie Marshes in central-west New South Wales. Technically, they were assisting the New South Wales Office of Environment and Heritage on a vegetation survey, but while there, they were able to snap some shots of the local waterbird life — in this case, glossy ibis *(Plegadis falcinellus)*, straw-necked ibis *(Threskiornis spinicollis)* and spoonbills — colonially nesting species that depend on healthy wetland vegetation in order to breed.

On a similar survey in 2013, swamp hens, egrets, crakes, terns and the red-kneed dotterel *(Erythrogonys cinctus)* were also recorded. The threatened Australian painted snipe *(Rostratula australia)* was also recorded at Macquarie Marshes over the 2011–12 summer.

Since 2009, the Commonwealth has delivered 3450 gigalitres[1] of environmental water to protect and restore rivers, wetlands and other environmental assets in the Murray-Darling Basin. As a result, wetlands within the Basin are providing refuges for woodland birds such as the threatened hooded robins *(Melanodryas cucullata)*, little eagles *(Hieraaetus morphnoides)* as well as emus (*Dromaius novaehollandiae novaehollandiae)*.

Waterbirds have diverse habitat and foraging requirements and respond differently to climate and catchment conditions. Colonially nesting ibis, spoonbills and herons require large and stable flows and the iconic brolga *(Grus rubicunda)* is dependent on freshwater meadows and graze on the annual herbs and rushes. Some waterfowl can breed in marginal conditions, but most require seasonal flows to get them really going.

The Commonwealth Environmental Water Office is working hard to improve our understanding of the varying ecological requirements of waterbird species, in particular how they respond to changing hydrological, habitat and food resource conditions. Improving the waterbird knowledge base will help to ensure that our environmental water delivery is efficient and effective in supporting waterbirds.

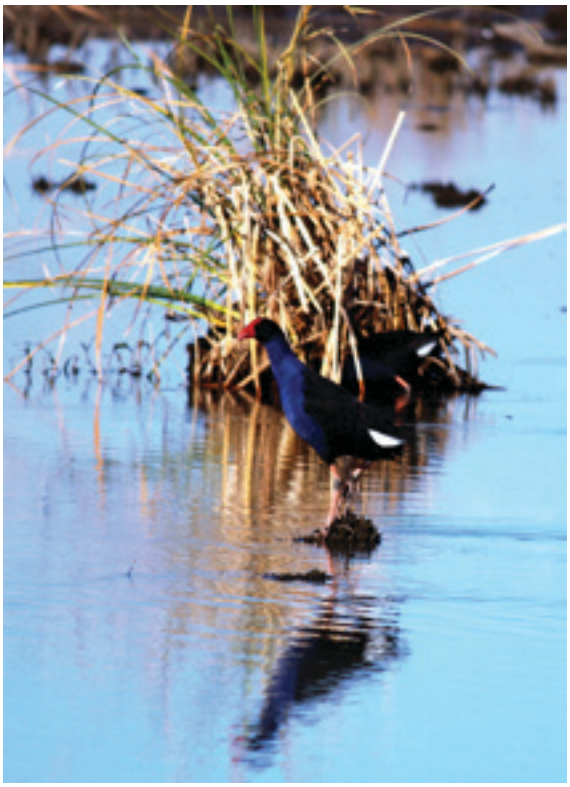
However, as the Basin continues to experience a drying climate, we can't be complacent.
The importance of having environmental water in reserve is becoming more evident — just in case....

[1] Commonwealth environmental water delivered as at 30 April 2014 (www.environment.gov.au)

Around 30 glossy ibis (Plegadis falcinellus) flying over Buckinguy Swamp at Macquarie Marshes, May 2014
(© Copyright, Hayley Behnke, Commonwealth Environmental Water Office)

Black-winged stilts (Himantopus himantopus) in the Gwydir Wetlands, March 2013 (© Copyright, Bruce Campbell, Commonwealth Environmental Water Office)

Yellow-billed spoonbills (Platalea flavipes) and Royal spoonbills (Platalea regia) in a dead tree at Willancorah Swamp in the Macquarie Marshes, May 2013
(© Copyright, Dave Straccioni, Commonwealth Environmental Water Office)



Swamp hens nesting at Willancorah Swamp in the Macquarie Marshes, May 2013
(© Copyright, Dave Straccioni, Commonwealth Environmental Water Office)

Rehabilitating lost lakes in western New South Wales

Paula D'Santos and James Maguire, New South Wales Office of Environment and Heritage

After 105 years of being disconnected from Murrumbidgee River flows, the Paika Lakes-Penarie Creek system is now playing host to a raft of waterbirds.

In May 2011, the first environmental water allocation flowed into the system inundating Paika Lake (400–550 hectares). Over the following two years, additional environmental flows were successfully managed for Cherax Swamp (18 hectares), Hobblers Lake (30 hectares) and Penarie Creek (130 hectares), collectively using 33 000 megalitres of New South Wales and Commonwealth environmental water.

Despite a century of dry conditions, thousands of waterbirds flocked back to the lakes, including the threatened freckled duck *(Stictonetta naevosa)*, blue-billed duck *(Oxyura australis)* and Australian painted snipe *(Rostratula australis)*. Following the installation of carp screens, aquatic vegetation recovery has been particularly promising in Cherax Swamp and Hobblers Lake which have supported a diverse waterbird population of up to 35 species.

The Paika Lakes-Penarie Creek system is a low-lying floodplain wetland complex within the Murrumbidgee catchment, approximately 20 kilometres north of Balranald in western New South Wales. This wildlife corridor connects semi-arid mallee country to the west with the river red gum forested floodplains and wetlands to the east. Under natural conditions the system regularly filled with floodwaters from the Murrumbidgee River, however in 1906 a series of levee banks and roads were constructed which disconnected the system from the river.

Since 2008, New South Wales Office of Environment and Heritage (OEH) environmental water managers have worked closely with local landholders to develop and implement a restoration project for the Paika Lake-Penarie Creek system. Funding from the Australian Government has supported installation of culverts, revegetation works, ecological monitoring and change to grazing and cropping practices to maximise the wetlands' biodiversity values.

CSIRO ecologists have been engaged to monitor ecological responses to the environmental flows. One of the interesting tools used has been time-lapse photography to document lake inundation and vegetation, and faunal response. Images captured provide a useful insight into how the local fauna populations have utilised the lake. Images include cormorants roosting, emus *(Dromaius novaehollandiae)* crossing Paika Lake, as well as feral cats, pigs and foxes. As a consequence of the monitoring, feral pest eradication measures have been conducted by landholders to help maximise the native fauna response.

Through the commitment of local landholders and with management advice and support from OEH, CSIRO and Australian Government agencies, the rehabilitation of this unique wetland complex has been implemented to help restore some of the region's lost biodiversity values.

For further information, please contact Paula D'Santos (Senior Team Leader, OEH, 03 5051 6234, Paula.Dsantos@environment.nsw.gov.au) or visit www.environment.nsw.gov.au/environmentalwater/index.htm

The installation of carp screens has helped the recovery of aquatic vegetation at the Western Lakes System near Balranald, New South Wales (© Copyright, Paula D'Santos, New South Wales Office of Environment and Heritage)

A CSIRO Reconyx monitoring camera captures bird life at Cherax Swamp in western New South Wales
(© Copyright, Dr Heather McGinness, CSIRO)

Environmental water supports waterbirds in Murray River Ramsar wetlands

Paul Childs, New South Wales Office of Environment and Heritage and Rick Webster, New South Wales National Parks and Wildlife Service

For the first time since major fires in 2008, Coppingers Swamp near the Mathoura township in New South Wales, has seen the return of waterbird breeding thanks to environmental watering in the Murray River.

In the spring of 2013, a colonial waterbird rookery formed within the 2000 hectare Gulpa Creek Wetland Complex at Reed Beds Swamp (North and South) and Coppingers Lagoon within the Murray Valley National Park (part of the Central Murray Forests Ramsar Wetland).

Adult waterbirds would have abandoned their nests as a result of dramatic variations to water height, so environmental water was diverted to maintain water levels to ensure waterbird chicks reached fledgling stage, and to maintain foraging grounds.

The rookery consisted of:

- 1267 pairs of Australian white ibis *(Threskiornis molucca)*
- 290 pairs of straw-necked ibis *(Threskiornis spinicolis)*
- 141 pairs of royal spoonbills *(Platalea regia)*.

Based on regular field observations by the New South Wales National Parks and Wildlife Service, large numbers of nestlings and fledglings were present throughout January 2014. Environmental watering was extended into early February 2014 because of extremely high temperatures and evaporation rates.

All waterbird nestlings had fledged by mid-February, and were observed foraging on habitat which became exposed as water levels receded.

This event also provided habitat for Australian little bittern *(Ixobrychus dubius)*, a nearby egret colony, juvenile white-bellied sea-eagles *(Haliaeetus leucogaster)* and swamp harrier *(Circus approximans)*. Straw-necked ibis were observed nesting within Reed Beds North for the first time since regular records have been kept.

The Reed Beds Swamp Birdhide is located along the sealed Picnic Point Road from Mathoura and gives panoramic views of the wetland. The site is easily accessible and provides interpretive displays and amenities. Nearby is the Edward River Day Use Area for visitors who wish to stop for a picnic or barbecue. Please visit www.nationalparks.nsw.gov.au/murray-valley-national-park/reedbeds-bird-hide-boardwalk/walking for more information on Reed Beds Swamp.

The environmental water was provided by the Commonwealth Environmental Water Office, the Murray-Darling Basin Authority through The Living Murray program and the New South Wales Office of Environment and Heritage.

Australian white ibis (Threskiornis molucca) and straw-necked ibis (Threskiornis spinicolis) with chicks at Reed Beds Swamp (© Copyright, Emma Wilson, New South Wales Office of Environment and Heritage)

Australian white ibis (Threskiornis molucca), royal spoonbills (Platalea regia) and straw-necked ibis (Threskiornis spinicolis) building nesting platforms on Reed Beds Swamp (© Copyright, Emma Wilson, New South Wales Office of Environment and Heritage)

Egrets observed foraging from the Reed Beds Swamp Birdhide (© Copyright, Emma Wilson, New South Wales Office of Environment and Heritage)

2011: A good year for Lower Murray black box regeneration

Anne Jensen, Nature Foundation South Australia's Water For Nature Committee

Nature delivered life-saving floods in 2010–2012, ending 10 years of severe drought for the River Murray and triggering mass germination in river red gums *(Eucalyptus camaldulensis)*, black box (Eucalyptus largiflorens) and lignum *(Duma florulenta)*.

Below the Darling junction, in the regulated Lower Murray River, tens of thousands of black box seedlings are thriving in black box woodlands that flooded in February 2011 (peak flows reached 90 000 megalitres per day). This is great news, since ecologists are reporting a lack of regeneration of black box further upstream.

These 2011 black box seedlings are very special, as the previous phase of successful black box regeneration in the Lower Murray dates back to the 1955–56 floods. There have been two large flood periods since then, however no black box regeneration from 1989–93 survived, and only a few pockets survived from 1973–5.

Scientists have reported that black box on Lower Murray floodplains are regenerating at less than one-third of the rate required to maintain current populations. Conditions in the Lower Murray in 2011 met the prescribed requirements for regeneration of black box, with flows over 80 000 ML/d and annual rainfall of over 300 millimetres (George *et al.*, 2005).

To ensure the survival of the current seedlings, Nature Foundation South Australia's Water For Nature Initiative is delivering environmental water to selected sites in the region, giving priority to sustaining the benefits of the floods, ensuring the survival of mass germination of seeds and building their resilience in floodplain ecosystems. The focus is on supporting black box seedlings through their first two summers by maintaining soil moisture (Jensen *et al.* 2008).

In a joint project between the Australian Government, landholders, irrigators, local government, community groups and regional agencies, various irrigation techniques are being used to apply water efficiently. The water is provided by the Commonwealth Environmental Water Holder, and the costs of delivery (energy, fuel, equipment, deploying of sprinklers and pipes, operation of pumps, and monitoring) are met by a crucial mix of very generous sponsors and supporters. More details of the black box watering, and other watering sites through the South Australian Riverland, can be found on the Water For Nature website (www.waterfornature.org.au).

The survival of the 2011 black box seedlings will be monitored closely, with environmental water added as required to give them their best chance of survival, to ensure the maintenance of healthy black box communities on the Lower Murray floodplain.

References

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Jensen, A.E., Walker, K.F., & Paton, D.C. (2008). *Smart Environmental Watering: getting most benefit from scant flows for floodplain trees* (River Murray, South Australia). In (Eds) Daniell, T., Lambert, M. & Leonard, M., Proceedings of Water Down Under 2008 Conference, 15–17 April, Adelaide, 1426–1437. Engineers Australia, Melbourne, Australia.

Lay-flat hose delivering environmental water in April 2014 to hundreds of black box (Eucalyptus largiflorens) seedlings under stressed black box woodland at Clarks Floodplain (© Copyright, Anne Jensen)

For further information, please contact Ian Atkinson, CEO of Nature Foundation SA (ian.atkinson@nfsa.org.au) or visit:

Water for Nature website: www.waterfornature.org.au

Nature Foundation SA website: www.naturefoundation.org.au

Water for Nature Initiative youtube video: www.youtube.com/watch?v=VNLFgtNW4kI

Water for Nature Clark's Floodplain launch Feb 18 2013 youtube video: www.youtube.com/watch?v=qXd8dsJxoMY

A miniature forest of healthy black box (Eucalyptus largiflorens) seedlings at Loxton Riverfront Reserve was watered by using pumps to fill a lagoon in November 2013 (© Copyright, Anne Jensen)

On-ground works improving creek and wetland management in the Murray and Murrumbidgee valleys

Paula D'Santos, New South Wales Office of Environment and Heritage

Achieving future goals often requires incremental steps forward.

It is this approach that New South Wales environmental water managers are taking to help maximise biodiversity values and improve environmental water management for a number of ephemeral creeks and wetlands within the Murray and Murrumbidgee valleys.

The New South Wales Office of Environment and Heritage (OEH) recently committed $250 000 to support small-scale on-ground works ranging from the installation of carp screens and the upgrade of regulators to investigative studies.

Ephemeral creek systems such as Tuppal, Jimaringle, Cockrans and Gwynnes Creeks, located in the mid-Murray region near the township of Deniliquin, have had investigative studies completed to help identify and prioritise future on-ground works. The creeks support a diversity of native fauna and flora, including some threatened species, and are highly valued by local communities. The investigations included the development of an inventory of current structures within the systems that impede flow, and looking at options to help improve the efficiency and effectiveness of future environmental water delivery. Local landholder support and advice, and the engagement of local contractors to undertake the work, has been key to the outcomes of these studies.

Minimising carp impacts is something that is important to OEH environmental water managers. Consequently, a number of carp screens have been installed in lower Murrumbidgee wetlands and at Thegoa Lagoon on the Murray River. By preventing carp movement into wetland areas targeted to receive environmental water, aquatic vegetation response is expected to improve and recruitment of frog species, including the endangered southern bell frog *(Litoria raniformis)*, to be maximised.

Funding has also helped support improved connectivity between the floodplain and the main rivers at select locations through the upgrade of existing water delivery infrastructure. The replacement of a regulator at Horseshoe Lagoon, in Millewa National Park on the Murray, will help increase inflow rates and improve fish passage between the river and the lagoon, which is used as a drought refuge by small-bodied native fish including the endangered flathead galaxias *(Galaxias rostratus)* and southern pygmy perch *(Nannoperca australis)*. This work, which was project managed by the New South Wales National Parks and Wildlife Service, is an important component of the Southern Pygmy Perch Recovery Plan currently under development.

Although small in scale, these on-ground works are important steps in moving forward towards improved management of our wetlands and rivers.

For further information, please contact Paula D'Santos (Senior Team Leader, OEH, 03 5051 6234, Paula.Dsantos@environment.nsw.gov.au) or visit www.environment.nsw.gov.au/environmentalwater/index.htm

Funding was obtained to upgrade existing water delivery infrastructure, like this regulator at Horseshoe Lagoon in the Millewa National Park, New South Wales (© Copyright, Paul Childs, New South Wales Office of Environment and Heritage)

The new regulator will help to improve connectivity between Horseshoe Lagoon and the River Murray in New South Wales
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Waterbird monitoring in inland New South Wales

Dr Jennifer Spencer and Tim Hosking, New South Wales Office of Environment and Heritage

Ground surveys for waterbirds are being undertaken in significant floodplain wetlands across New South Wales including the Macquarie Marshes, Gwydir Wetlands, Narran Lakes, Murray Wetlands, Mid-Murrumbidgee and Lower Murrumbidgee Wetlands.

The surveys are being conducted by the New South Wales Office of Environment and Heritage (OEH) and are part of monitoring activities that OEH undertakes to support environmental water management by the New South Wales and Commonwealth governments.

The ground surveys are conducted in spring (October–November) to coincide with the survey dates of annual aerial waterbird surveys conducted by the Centre for Ecosystem Science, University of New South Wales (www.ecosystem.unsw.edu.au/list-program-projects/waterbirds) with additional surveys conducted in selected wetlands in summer and autumn months alongside the delivery of environmental water.

Bird observers conducted ground surveys at Bunnor, Gwydir Wetlands

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Aerial surveys provide a rapid cost-effective assessment of relative abundance and information on the locations of waterbird breeding colonies, while ground surveys are more effective for estimating the abundance and diversity of smaller and more cryptic waterbird species. Both survey programmes provide information on waterbird population trends and the ecological outcomes of specific flow events, supporting environmental water management and planning.

Surveys to date have detected more than 64 waterbird species across 120 survey sites in inland New South Wales. This includes two nationally endangered species (the Australasian bittern *(Botaurus poiciloptilus)* and Australian painted snipe *(Rostratula australis)*), seven threatened waterbird species listed in New South Wales and 11 waterbird species listed under one or more Australian migratory bird agreements with Japan (JAMBA), China (CAMBA) and the Republic of Korea (ROKAMBA). This survey programme is ongoing with further surveys planned for 2014–15.

The New South Wales Office of Environment and Heritage manages a portfolio of discretionary environmental water licenses and allowances for the Murrumbidgee, Gwydir, Macquarie, Lachlan, Murray and Lower Darling catchments.

For further information see: www.environment.nsw.gov.au/environmentalwater/manageenvwater.htm

The Monkey Lagoons is an established ground survey site in the Macquarie Marshes Southern Nature Reserve
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