



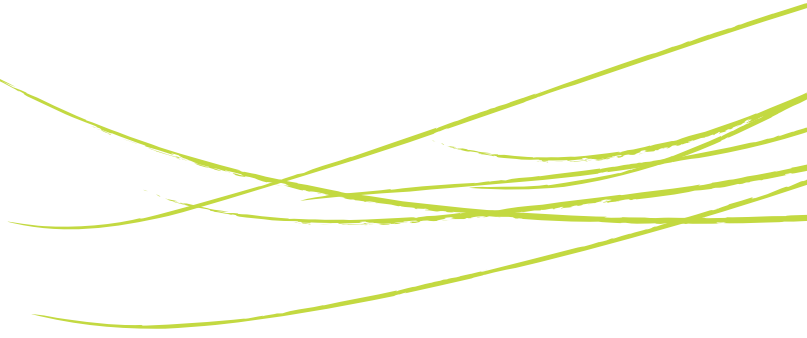
Australian Government

**Department of Sustainability, Environment,
Water, Pollution and Communities**



Wetlands Australia

NATIONAL WETLANDS UPDATE JULY 2013 - Issue No 23



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Front Cover photos: (Left to right) Baby bird (Keith Ward), Piccaninnie Ponds (Kirsty Wilkes), Sand bottlebrush (Bryony Fremlin), Black-necked stork (Brian Furby), Black tailed native hen (Roger Williams), Pillicawarrina (Louise Armstrong, CEWO).

Rear Cover photos: (Left to right) Birds nested in the hollows of this tree at Dix swamp for generations (Christine Bull Photography), The Ruppia Translocation Project is part of the Murray Futures Coorong, Lower Lakes and Murray Mouth Recovery Project (Gemma Cunningham), Kakadu (Northern Australia Hub, National Environmental Research Program), Shrubs on clay flats, Ansty Keane Dampland (Bryony Fremlin), Aspley Marshes (Sarah Young), Over 3 million plants have been planted around the Lower Lakes and Coorong since 2009 (Andy Rasheed).



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INTRODUCTION

Monitoring, research and trials of new approaches are helping us learn more about Australia's wetlands and how to manage them. Community groups, non-governmental organisations, researchers, land holders and governments are all involved.

In this edition of Wetlands Australia several of these groups share their experiences of wetland research, management, restoration and community action.

If you would like to contribute to future editions of Wetlands Australia contact **wetlandsmail@environment.gov.au**



Boardwalk at Piccaninnie Ponds (*Kirsty Wilkes*).



WetlandCare Australia ecologists conducting fieldwork (*Adam Gosling*).

WETLAND RESTORATION AND CONSERVATION



Polygala removal from Observation Point (*Phillip Island Nature Parks*).

Protecting habitat of international significance for shorebirds at Observation Point


**Ilona Fenner, Port Phillip and Western Port
Catchment Management Authority**

A pest plant control program has helped to safeguard shorebird habitat at Observation Point on Phillip Island's Northeast coast.

A lack of resources and the remote location had meant that little had been done over the years to

stifle the spread of weeds at Observation Point on Phillip Island's Northeast coast, an area of international significance as wetlands habitat for shorebirds. With resources provided through the Ramsar Protection Program, Phillip Island Nature Parks stepped in and began a pest plant control program that has made a major contribution to the protection of the character of Observation Point and helped to safeguard it as habitat for shorebirds.

A sensitive coastal region, Observation Point relies on native vegetation and particularly



the banksia woodland to prevent erosion and protect the area as a significant breeding area for ground-nesting birds like buff-banded rails and hooded plovers. In late 2012, as part of the Ramsar Protection Program, the introduced dolichos pea that was threatening the banksia woodland, was controlled, allowing this important vegetation to thrive.

Weeds like bridal creeper and the shrub polygala that began as garden plants in the neighbouring urban area spread prolifically into the nature reserve. Over a period of around 25 years these weeds made their way right out to the tip of Observation Point, strangling and shading out indigenous plants in their path.

A major effort of manual removal of polygala shrubs, some up to 2 metres high, in September of 2012 has cleared away all the adult polygala in the area. Small weed seedlings that developed

over the summer were systematically controlled in late autumn. The area is now experiencing the regeneration of native species; sticky hop-bush and bursaria are amongst the natives germinating where the canopy of polygala has been removed.

Phillip Island Nature Parks is a partner in the Ramsar Protection Program (<http://www.ppwcma.vic.gov.au/our-projects/major-environmental-projects/ramsar-protection-program.aspx>), which is working to protect habitat for shorebirds and migratory birds in the region. The Program is supported by the Port Phillip and Westernport CMA, through funding from the Australian Government's Caring for our Country and is part of Australia's commitment to the Ramsar Convention, which strives for the conservation and wise use of all wetlands.



Threatened fish reintroductions (*Adam Watt*).


The return of threatened native fish to South Australia's Lower Lakes

Adam Watt, SA Department of Environment, Water and Natural Resources; Nick Whiterod, Aquasave Consultants – Nature Glenelg Trust and Chris Bice, South Australian Research and Development Institute

Unprecedented water shortage and habitat degradation between 2007 and 2010 placed the Coorong, Lower Lakes and Murray Mouth (CLLMM) region on the verge of collapse and

threatened native small-bodied freshwater fish species with the risk of local extinction.

Wide-ranging multi-agency conservation measures (many under the South Australian Drought Action Plan for Murray Darling Basin (MDB) Threatened Freshwater Fish Populations) were initiated with the objective of conserving these fish species during this period. This included the removal of individuals from the wild and captive maintenance and breeding, with the objective of reintroducing fish to wild habitats upon the return of favourable conditions.



In 2010-11, broad-scale rainfall and significant inflows in the MDB resulted in increased flows to South Australia and improved flow and habitat availability across the CLLMM region. In turn, salinities declined, dry or isolated habitats became inundated and reconnected, and submerged and fringing emergent vegetation communities exhibited signs of recovery. This provided the opportunity to reintroduce the captive bred threatened fish species back into the region.

The Critical Fish Habitat project, part of the Murray Futures CLLMM Recovery Project, was developed to provide a scientifically robust framework to guide the reintroduction of four fish species to the region: Yarra pygmy perch (*Nannoperca obscura*), southern pygmy perch (*Nannoperca australis*), southern purple-spotted gudgeon (*Mogurnda adspersa*) and Murray hardyhead (*Craterocephalus fluviatilis*). The framework drew on knowledge of the ecology and habitat of each species to direct best-practice identification and assessment of potential sites and develop a methodology for release and post-reintroduction monitoring. This approach was taken to enhance the success of the reintroductions and restore self-sustaining wild populations.

Across four rounds of reintroduction between spring 2011 and autumn 2013, approximately 15-000 fish were released into 10 suitable sites. Encouragingly, post-reintroduction monitoring has highlighted initial signs of survival, with over 100 individuals sampled across the four species, and wild recruitment (in three of the species).

Ongoing reintroductions (and post-reintroduction monitoring) will be necessary to increase the likelihood of establishing self-sustaining wild populations of the four threatened species in the region. To do this, strong cross-agency partnerships developed during the projects will need to be supported and maintained to conserve threatened fish species in the Lower Lakes and respond to periods of water shortage anticipated in the future.

For more information about the Critical Fish Project contact adam.watt@sa.gov.au

The CLLMM Recovery Project is part of the South Australian Government's Murray Futures program, which is funded by the Australian Government's Water for the Future initiative.

The South Australian Government acknowledges Ngarrindjeri are the Traditional Owners of the land and that according to their traditions, customs and spiritual beliefs its lands and waters remain their traditional country.



Dix Swamp with water in it, March 2012 (*Christine Bull*).

Wimmera wetlands shine through drought, fire and floods

Melissa Pouliot for Wimmera Catchment Management Authority

The Wimmera in Western Victoria is home to some of the state's most precious wetland areas, with more than 2000 wetlands, including shallow seasonal swamps, deep lakes and salt lakes. When the region is wet, it supports a variety of wetland plants and animals and becomes a migration hot-spot for birds.

The Wimmera Catchment Management Authority's (CMA) Habitat Tender program, which started five years ago, has helped support Wimmera farmers in protecting more than 2000 hectares containing 88 wetlands.

Fifteen kilometres east of Edenhope, farmers Wayne and Pam Caldow and their son Hugh live in the heart of this biodiversity hotspot. Through the extremes of drought, floods and fire, the family remain positive and motivated about helping secure the future of their wetlands.

One of the biggest challenges they have faced was a fire sparked by lightning in March this year. They saved the house and surrounding sheds. But all that is left of the swamp they overlook from their back veranda is charcoal-coloured tree trunks, crunchy scorched brown leaves and a blackened expanse where the shallow wetland used to lie.

However, Wayne is thankful three swamp areas the family has protected through the Habitat Tender program escaped fire damage.



Birds nested in the hollows of this tree at Dix swamp for generations (*Christine Bull*).

“We count ourselves very lucky these three swamp areas weren’t burnt,” Wayne says. “We’ve put a lot of work, time and effort into them with funding, planning and management support from the CMA. We are so pleased we can continue to enjoy the massive regeneration of native grasses and red gums as a result of the work we’ve done.”

When the opportunity arose to be part of the CMA program, allowing Wayne to continue work he had been doing on his farm for many years, he jumped at the chance. “Being able to protect swamp areas without the financial burden of

doing it ourselves was a real bonus,” he says. “And it’s invaluable to have support and advice from the CMA through a five-year management plan for our swamps.”

After fencing off three wetland areas from stock, planting trees and controlling weeds, the family took it a step further with a Trust for Nature conservation covenant. “The standards and values a Trust for Nature conservation covenant places on the land match the standards that we have for the land. Plus it adds value to them environmentally and provides long-term security,” Wayne says.

“There’s been the longest drought on record followed by floods in the summer of 2010-11 where the swamp country came back to life with regrowth of habitat even though they’d been dry for so long. It’s nice to know everything is still there and regardless of the challenges of drought and fire, when the water returns it will all just switch back on again.”



The burnt Dix Swamp habitat tree in March 2013 (*West Wimmera Advocate*).



Water mouse close up during monitoring event at Bustard Bay (*Ian Gynther*).

Baselines and discoveries – Coastal 20 Wetlands Project

**Cassie Price and Adam Gosling,
WetlandCare Australia**

WetlandCare Australia and numerous partners are still absorbing the success of their recently completed Coastal 20 Wetlands Project, funded by the Australian Government's Caring for our Country. In 2011, the project set out to rehabilitate 20 iconic wetlands sites in varying states of degradation along the coast in south east Queensland and northern NSW.

The contributions of more than 150 project partners and over 4000 individual volunteers working with WetlandCare Australia has led to improvements across more than 3500 hectares of wetlands. These wetlands are critical as refuge for a range of threatened flora and fauna.

Baseline monitoring and evaluation has been a corner stone of the Coastal 20 Wetlands Project. Not only have we tracked the rehabilitation progress of the 20 sites during the three year project duration, but we have stimulated considerable community uptake to continue monitoring into the future. The Project has seen



A Coastal 20 field team on site in south east Queensland (Adam Gosling).

almost 500 community members trained in various elements of baseline wetland monitoring.

WetlandCare Australia, project partners and the community alike were excited to discover a wider distribution of the threatened water mouse or yirrloo (*Xeromys myoides*) than was previously known. To add to their known but limited distribution, a previously undiscovered South East Queensland population was found. These rare wetland mammals take refuge in wet and marshy areas on the coastal fringe, feasting on small prawns, shellfish and crabs. They build tall mud nests complete with mud-slide escape routes. The Coastal 20 Wetlands Project did not stop at simply monitoring and researching this

previously unknown population, but enhanced and protected their critical habitat.

WetlandCare Australia hope to continue to build on the support and momentum generated from project partners and the community by moving into new rehabilitation phases for existing sites and expanding into other important sites on the Queensland and NSW coastal fringes.

For more information visit wetlandcare.com.au or contact WetlandCare Australia:
Project Manager: Adam Gosling, 02 66816169, adamgosling@wetlandcare.com.au
Regional Manager: Cassie Price, 02 66816169, cassieprice@wetlandcare.com.au.

AQUATIC PLANT RESTORATION



Boat with environmentally friendly mooring at Dalpura Bay (*SEQ Catchments*).

Seagrass making a comeback

Sibel Korhaliller, SEQ Catchments

Seagrass is making a comeback in Moreton Bay, thanks to an award winning new boat mooring design that causes minimal disturbance to the seabed floor.

Boating remains a popular pastime in Moreton Bay. A lesser known impact of this is happening below the ocean surface, with traditional

moorings ripping up seagrass as the chain drags on the seafloor. As a result, 'crop circles' in a classic halo shape are formed.

Seagrass beds are one of the most important marine environments on earth. They are home to juvenile fish and crustaceans that form the basis of commercial and recreational fisheries. They provide food for globally vulnerable dugongs, and green turtles.



“Crop circles” caused by traditional moorings in Morton Bay (SEQ Catchments).

But according to a scientific study, 58 per cent of the world's seagrass meadows are currently declining. There are many factors that contribute to the decline of seagrass, including sediment runoff and algal blooms, but perhaps less known is the damage from block and chain moorings.

Environmentally Friendly Moorings offered in Queensland for the first time

Between 2012 and 2013, over 100 ‘Seagrass Friendly Moorings’ were offered to boaters at three locations across Moreton Bay, following a successful trial.

Environmentally friendly moorings cause less damage to the seagrass bed, by ensuring there is minimal contact with the sea bed, while still being able to safely secure vessels in the environmental conditions of Moreton Bay.

The Seagrass Friendly Mooring was recently awarded the 2013 Product and Manufacturing award at the Healthy Waterways awards and has previously featured on the ABC's New Inventors Program.

How much seagrass will recover as a result of these moorings?

Up to 15 per cent of seagrass is scoured out by boat moorings in Moreton Bay. Each boat can scour out as much as 1400 square metres of seagrass, leaving a desert like area void of marine life.

By using these new designs, an area of approximately 18 football fields of seagrass will begin to recover, although the cumulative benefit to surrounding seagrass beds is expected to be much higher covering an area as large as 120 hectares.

At June 2013, 110 boats were secured with these new moorings installed, free of charge, through a voluntary program coordinated by SEQ Catchments and funded through the Australian Government's Caring for Our Country program, as well as the Queensland Government, OceanWatch Australia and WetlandCare Australia.

For further information visit www.seqcatchments.com.au/case-studies/mooring-trial-to-end-crop-circles-in-moreton-bay or contact Sibel Korhaliller at skorhaliller@seqcatchments.com.au



The *Ruppia* Translocation Project is part of the Murray Futures Coorong, Lower Lakes and Murray Mouth Recovery Project (*Gemma Cunningham*).

Seagrass translocation in the Coorong


Katherine Ryan, South Australian Department of Environment, Water and Natural Resources

A unique project is aiming to return a native seagrass to South Australia's iconic Coorong.

The *Ruppia* Translocation Project, part of the Murray Futures Coorong, Lower Lakes and Murray Mouth (CLLMM) Recovery Project, is being delivered in partnership with the Traditional Owners of the CLLMM region, the Ngarrindjeri. Restoring the health and character

of the Coorong is a long-held aspiration of Ngarrindjeri, and the Ngarrindjeri Regional Authority (NRA) has been directly involved since project inception. The NRA is also delivering critical heritage clearance and on-ground work for the project.

Ruppia tuberosa provides habitat and food for invertebrates, native fish, and food for migratory waterbirds. However, inadequate flows of fresh water to the region, especially during the recent drought, had a devastating impact on the ecological health of the Coorong. When the drought broke and the inflows returned, *Ruppia* populations did not return on a large scale, especially in the Coorong's South Lagoon.



Associate Professor David Paton from the University of Adelaide trialled a number of translocation methods and this research led to using seed sediment taken from nearby lakes when they were dry and transferring these to the mudflats on which *Ruppia* grows in the Coorong.

The seed sediment has been sourced from Lake Cantara, an ephemeral lake in the Coorong National Park. In 2013 a small excavator was used to scrape the top layer of sediment (15 millimetres) containing the seeds when the lake was dry. Track mats were used to reduce the impact of the excavator. Seed was collected in strips leaving even-width gaps to promote faster recovery at the collection site. Less than one hectare of the total 200 hectare lake bed has been used for seed sediment collection.

The collected seed sediment was used to treat 20 hectares of mudflats on the eastern side of the Coorong South Lagoon. So far the planting has involved lightly agitating the mudflat surface, scattering the seed sediment, and then pressing it into the soil. Deeper sections of mudflats had shallow water cover at planting time. Here seed sediment was scattered directly into the water, where the sediment and seeds should sink provided local wave action is not excessive.

Further research will be used to review and refine the project in the future.

For more information about the Ruppia Translocation Project contact **katherine.ryan2@sa.gov.au**

The CLLMM Recovery Project is part of the South Australian Government's Murray Futures program, which is funded by the Australian Government's Water for the Future initiative.

The South Australian Government acknowledges Ngarrindjeri are the Traditional Owners of the land and that according to their traditions, customs and spiritual beliefs its lands and waters remain their traditional country.



Over 3 million plants have been planted around the Lower Lakes and Coorong since 2009 (*Andy Rasheed*).

Restoring the sedge and reed bed habitats of the Lower Lakes in South Australia

Sacha Jellinek, James Thiessen and Simon Cheers, South Australian Department of Environment, Water and Natural Resources

Since the establishment of intensive agriculture in the Murray Darling Basin including around the Lower Lakes and Coorong in South Australia, there has been a loss of natural habitats and alteration of waterways, changing how the landscape and associated ecosystems function. These changes have been exacerbated by the Millennium drought, causing the Ramsar listed

Lower Lakes and Coorong wetlands, and their surrounds to become increasingly degraded. Impacts included exposure of acid sulphate soils, increased lakeshore erosion and habitat loss, simplification and fragmentation.

To combat these processes, the Coorong, Lower Lakes and Murray Mouth (CLLMM) Recovery Project has been working closely with the traditional owners, the Ngarrindjeri, as well as regional communities over the past two years of a five year program to plan, prioritise and implement an ecological restoration program to help strengthen social and ecological resilience in region. Since 2009, the program has planted over three million plants around the Lower Lakes



The shorelines of Lake Alexandrina and Lake Albert have been replanted with 13 000 river club rush (*Simon Cheers*).

and Coorong, aerially seeded up to 10 000 hectares of the exposed lakebed during the drought and restored lakeshore vegetation.

To complement the terrestrial plantings the shorelines of Lake Alexandrina and Lake Albert have been replanted with 13 000 river club rush (*Schoenoplectus validus*) over the last two years and a further 140 000 sedges are being propagated for planting in Spring 2013. Plantings have taken place in priority areas that provide multiple benefits such as the addition of carbon to reduce the production of acid sulphate soils, and reduction of wave energy to decrease bank erosion. Sedge plantings are also thought to promote the natural regeneration of in-shore aquatic plants, thereby increasing habitat for fish, water birds and invertebrates. In order to assess these benefits and inform management decisions, a monitoring program is currently being undertaken.

The Ngarrindjeri and the Milang and District Community Association have played a vital role

in the replanting of these important reed beds. Community members have developed innovative propagation and planting techniques that increase the success of sedge plantings.

The link between community participation, education and collaborative management actions fostered under this program makes it stand out in the conservation and wise use of Australian wetlands.

For more information about the Vegetation Program contact james.thiessen@sa.gov.au

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MANAGING ENVIRONMENTAL WATER FOR WETLANDS



Red gums and mixed marsh at Mole Marsh, April 2013 (*Daniel Rothenfluh, CEWO*).

Environmental water into the Macquarie Marshes—building resilience

Commonwealth Environmental Water Office

In late spring 2012, delivery of 100 gigalitres (GL) of Commonwealth environmental water to the Ramsar listed Macquarie Marshes in central west NSW commenced. This volume complemented 166 GL of NSW environmental flows, making it the largest managed environmental water delivery event ever undertaken in the Macquarie Marshes. The target was the ecologically diverse reed beds,

eucalypt forests and woodlands that make the Marshes such a unique and environmentally valuable asset.

It followed two years of good inundation from a combination of runoff from large natural rainfall events and smaller managed environmental water delivery. The condition and species richness of wetland vegetation showed signs of improved health compared to the situation at the end of the Millennium Drought in 2010.

In recognition of the need to re-build the wetland's capacity to be resilient to drought periods, the 266 GL was delivered into the



Wavy marshwort in the southern lagoons (*Daniel Rothenfluh, CEWO*)

Marshes by late January 2013. This water supported new growth in river red gums and reed beds and provided habitat for native fish, frogs, birds and other animals well into autumn 2013. The flows also assisted to suppress dryland weed species that have encroached into the system as a result of river regulation and periods of drought. While large numbers of waterbirds were observed foraging in the Marshes in early 2013, only small bird breeding events occurred, possibly as a result of a drier than average spring and summer.

Since Commonwealth environmental watering began in the Macquarie Marshes in 2010 nearly 168 GL has been provided to the Marshes in cooperation with the NSW Office of Environment and Heritage (OEH), the Macquarie Marshes Environmental Flow Reference Group (EFRG) and NSW State Water.

When undertaking environmental watering, the Murray-Darling Basin Plan requires the Commonwealth Environmental Water Holder (CEWH) to maximise environmental benefit, including by having regard to Indigenous values. In consultation with OEH and the EFRG, the Commonwealth Environmental Water Office is currently planning to contribute to another watering action in winter-spring 2013 into the core wetlands, which need to receive flows on an annual basis. This action will support plants like cumbungi, nardoo and spike rush which are important to the Wailwan community, the area's Traditional Owners. Other important species will also benefit from continued flows into the Macquarie Marshes, one of Australia's important and iconic Wetlands of International Importance.



Example of understorey response at wetland that did not receive environmental water, February 2013
(Sascha Healy, NSW Office of Environment and Heritage).

To intervene or not intervene – the value of environmental water during drought

**Sascha Healy and Paula D’Santos, NSW
Office of Environment and Heritage and
Cherie Campbell, Murray-Darling Freshwater
Research Centre**

Understorey vegetation plays an important role in riparian and floodplain ecosystems of the Murray-Darling Basin. Wetland and floodplain plants provide habitat for fauna, contribute to food webs, nutrient cycling and water quality processes and generally contribute to the biodiversity of ecosystems.

The NSW Office of Environment and Heritage and the Murray-Darling Freshwater Research Centre recently completed a project focusing on understorey vegetation at eight wetlands on the Murray River between Wentworth and the South Australian border in New South Wales. The study comprised four wetlands that received environmental water during the drought (2001-2010) and four wetlands that remained dry during this period. All eight wetlands received overbank flows in 2010-11. The objective of the study was to evaluate the benefit of management intervention during the drought with regard to response of wetland vegetation post-flooding.



Example of understorey response at wetland that received environmental water February 2013
(Sascha Healy, NSW Office of Environment and Heritage).

Wetlands that received environmental water during the drought responded better to the 2010-11 floods by developing a more diverse and abundant wetland plant community than wetlands that remained dry. Environmental watering during drought years seems to have provided some resilience to the wetlands in terms of their ability to respond to a flooding event. Environmental watering should enable numerous soil stored seeds and propagules to germinate, grow, complete their life-cycles and re-set-seed, thus replenishing the seed bank and enabling wetland plant communities to establish with greater abundance during the next favourable conditions.

However, the response of components of the wetland vegetation post-flooding, particularly submerged macrophytes, was limited. There was a scarcity of submerged macrophytes observed, including wetlands previously known

to have developed these communities following environmental watering. A potential explanation is that sediment deposition during the recent flood, which was several inches thick at some wetlands, may have inhibited germination of wetland plants. Other contributing factors may include disturbance from carp, the depth and duration of the flooding event and water quality (e.g. turbidity).

Findings from the monitoring provide support for the ongoing environmental water management of the Murray River and its associated floodplains and wetlands especially during drought periods. This will assist in the continued management of these individual sites.

** OEH and MDFRC wish to acknowledge Murray Darling Wetlands Working Group who permitted access to data from 2008-09*

WETLAND MANAGEMENT TOOLS



Discussing peat soils at Belmont State Park, Lake Macquarie NSW (*WetlandCare Australia*).

WetlandCare Australia's Wetland Assessment Technique—a practical tool for natural resource managers & landholders alike

Kirralee Donovan, WetlandCare Australia

Effective wetland management has a strong emphasis on assessment, monitoring and evaluation. Integral to this process is the collection of sufficient baseline data. This data needs to be detailed enough to paint an accurate picture of wetland health, guiding the identification and prioritisation of issues as well as providing a critical point of comparison to assess the success of on-ground action over time.

The availability of resources to monitor management works over an extended period is a challenge commonly faced in wetland management. Landholder and community involvement in this process is invaluable in gaining an understanding of restoration efforts in the immediate short-term, during and after works, but also in the long-term.

WetlandCare Australia, a leading national wetland conservation organisation, has been building community skills and capacity in wetland monitoring through their Wetland Assessment Technique. The technique is a field-based tool used to assess various aspects of wetland health. It is designed to monitor changes over

time and recognise appropriate triggers for improved management.

The Assessment Technique has proved to be of equal value to landholders working at a local property scale and to natural resource management organisations working on catchment scale wetland condition assessment, management and improvement. The technique helps to increase the capacity of a range of stakeholders from individuals with scientific backgrounds to landholders with minimal knowledge and understanding of wetland functions and processes.

Implementation of the technique has shown that the benefits of building broader community involvement in wetland assessment methodologies are twofold; managers are able to see the long-term outcomes of conservation efforts and dollars spent on the ground and landholders are able to build their understanding, skills and capacity in managing their wetlands and local environment.

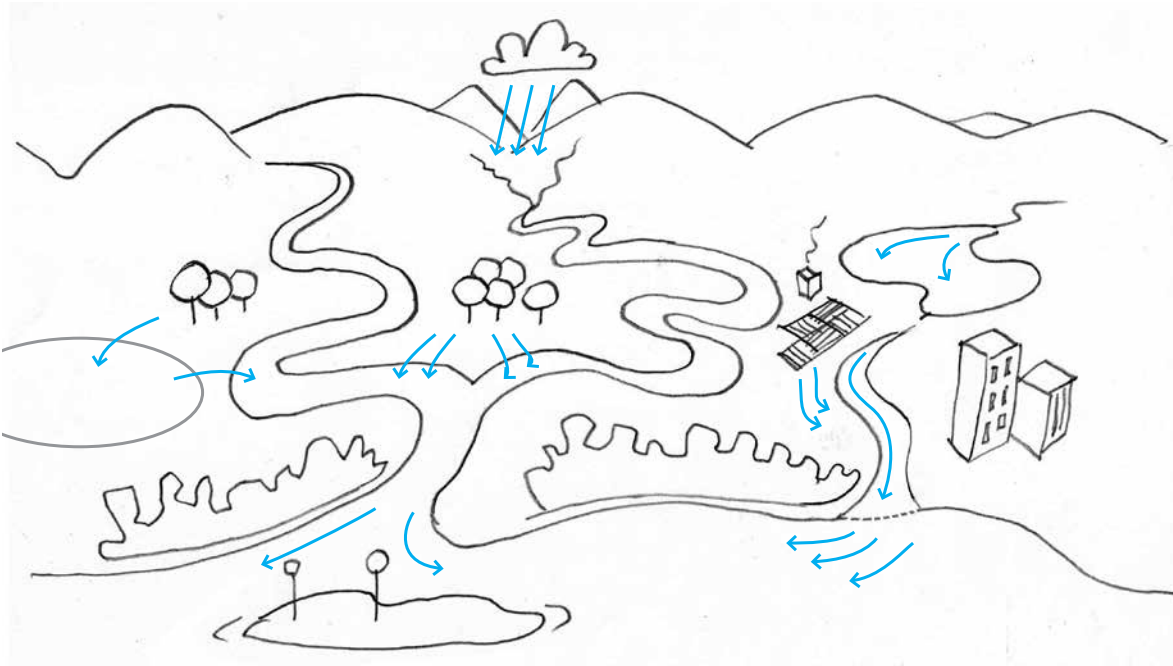
The Assessment Technique provides a comprehensive basis for natural resource managers to rapidly monitor the overall health and general condition of wetlands, achieving greater baseline data and understanding of change over time. Impact monitoring to measure environmental change aims to result in the timely implementation of protection, restoration or rehabilitation measures - the overall objective of effective wetland management.

The data collected from wetland monitoring efforts like the Wetland Assessment Technique is often fed into State Government planning, policy making and wetland mapping hence influencing priority wetland management works and further monitoring efforts.



Cassie Price teaching the community elements of the Wetland Assessment Technique at Partridge Creek, near Port Macquarie NSW (WetlandCare Australia).

For further information on the Wetland Assessment Technique, wetland issues and management options contact WetlandCare Australia, (02) 6681 6169, **ballina@wetlandcare.com.au** or visit **www.wetlandcare.com.au**.



A rough preliminary sketch from the storyboard for the Aquatic Ecosystem Connectivity animation (Damien Ledwich, ToadShow Pty Ltd).

Connectivity and the landscape

Queensland Wetlands Program


An appreciation of the connection of a wetland to other wetlands and to the broader catchment, landscape and seascape is important for making effective management decisions. In fact many of the values and ecosystem services credited to wetlands can only be provided when the wetlands are part of a connected network.

Connectivity is underpinned by the interaction between the wetlands, habitats, species and the ecological processes within the landscape. Without an understanding of these underlying processes, it is both difficult to define and assess

connectivity to inform management actions to conserve or restore wetland values.

While some effective wetlands management actions can be conducted at a site level, without an appreciation of the connection of the wetlands to other wetlands and the broader landscape, many site-specific actions may be of limited value.

Over recent years there has been an increasing realisation among planners, managers and policy makers that effective management of wetlands is often hampered by the lack of a consistent framework for understanding the vital role connectivity plays in their structure and function.



The *Framework for evaluating aquatic ecosystem connectivity* (<http://wetlandinfo.ehp.qld.gov.au/resources/static/pdf/ecology/connectivity/qwp-connectivity-project-22-2-13.pdf>) has recently been released by the Queensland Wetlands Program (QWP) to assist wetland managers to make the most effective decisions. The framework describes a process for systematically and transparently working through the connectivity for relevant functions of an aquatic ecosystem, and identifying the appropriate scale to apply to their management.

The connectivity framework was developed through expert workshops involving policy makers, scientists and individuals from a wide range of disciplines.

A method for collecting information relating to connectivity has also recently been developed. *Walking the landscape—a whole-of-system framework for understanding and mapping environmental processes and values* (<http://wetlandinfo.ehp.qld.gov.au/resources/static/pdf/ecology/connectivity/walking-the-landscape-15-02-13.pdf>) can be effectively used in conjunction with the framework (See Wetlands Australia February 2013 edition).

To help to understand connectivity and its importance, and how it complements the framework, a short video with animation has been developed.

The key principles for understanding aquatic ecosystem connectivity are:

- Connectivity is a mechanism that facilitates ecological processes.
- Knowing that there is the potential for connectivity to occur does not guarantee that it actually will occur.
- Connectivity occurs through the physical environment, that is, through air, water, land and underground.
- All relevant parts of the ecosystem (including soils, plants and animals) and connectivity are important for long-term environmental resilience.
- It is important to consider the entire area that may be affected by ecological processes, for example, flooding over the landscape, and the duration of the impact, to better understand how the processes work and the time and scale of their impact.

The key principles for managing aquatic ecosystem connectivity are:

- Connectivity should be linked to the overall management objectives.
- Knowledge gaps and uncertainty exist, but should not stop decision making.
- Developing conceptual models of underlying processes help to identify and understand connectivity.
- Adaptive management allows for decisions to be refined over time.

Guidelines and template for preparing a wetland management plan

Queensland Wetlands Program, Department of Agriculture, Fisheries and Forestry, Queensland Murray-Darling Committee and Wetlands International-Oceania

The power of partnerships

A powerful alliance of wetlands specialists, government, and rural landholders has led to the production of a new management tool—*Guidelines and template for preparing a wetland management plan*¹.

The guidelines are accompanied by two case studies from beef producers sustainably managing semi-arid grazing enterprises in the catchment of the Murray-Darling Basin. The guidelines provide step-by-step instructions for landholders and other wetland managers to prepare a wetland management plan.

The partnership was formed between the Queensland Department of Environment and



Grassy floodway at Wallen (Roger Jaensch, Wetlands International).

Heritage Protection (Queensland Wetlands Program); the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF); Wetlands International—Oceania; the Queensland Murray-Darling Committee (QMDC); the South-West Natural Resource Management team and two South West Queensland property owners.

QMDC's Water and Wetlands Program Leader, Paul Webb, outlines the value of the guideline:

"QMDC now uses or adapts the guidelines and template in the development of Wetland Management Plans as stand-alone documents, or, as part of sub-catchment plans over a variety of landscapes across the Queensland Murray-Darling Basin. Plans can then be implemented and support can be garnered from public funding using the plans as a basis for funding applications".

Case studies prove financial gain

A key part of the project was to provide landowners with information through case studies, demonstrating the financial benefits of good land and wetland management practices.

The case study on 'Shannendoah'², north of Bollon, was undertaken to determine the benefits, both economic and environmental, of introducing new grazing regimes. Large paddocks were divided into smaller grazing areas, each serviced by off-stream watering points. The owners have recognised the importance of optimising land condition and the benefits to production.

The second case study on 'Wallen'³, north of Cunnamulla, also focused on introducing a



22 Mile Waterhole, Wallen (Roger Jaensch, *Wetlands International*).

new grazing regime that included careful water management, bore capping, and a fencing program. Results have included an increase in the control of flowing water and livestock habits, more sustainable production, increased protection of biodiversity, and improved condition of riverine and other wetland systems.

The *Guidelines and template for preparing a wetland management plan* integrates with other recently updated tools available through *WetlandInfo*⁴. The guideline provides practical information for wetland managers developing management plans. It is compatible with existing property or

sub-catchment management plans, grazing management plans, and may assist in the development of land management agreements.

- 1 <http://wetlandinfo.ehp.qld.gov.au/wetlands/resources/publications/reports.html>
- 2 <http://wetlandinfo.ehp.qld.gov.au/resources/static/pdf/resources/reports/farming-case-studies/cs-shannendoah-property-south-west-12-04-2013.pdf>
- 3 <http://wetlandinfo.ehp.qld.gov.au/resources/static/pdf/resources/reports/farming-case-studies/cs-wallen-property-south-west-12-04-2013.pdf>
- 4 <http://wetlandinfo.ehp.qld.gov.au>

MONITORING AND RESEARCH

Research team uncovers productivity of northern floodplains

Amy Kimber, Northern Australia Hub - National Environmental Research Program

A team of researchers from the Northern Australia Hub of the National Environmental Research Program is mapping hotspots of floodplain productivity across northern Australia.

The team aims to quantify which areas are hot spots of food and energy production by measuring microscopic algal growth on floodplains, collecting small tissue samples from fish and other aquatic wildlife, and using remote sensing techniques to assess flooding patterns.

Field work is currently underway in Kakadu National Park and the Daly River in the Northern Territory to better understand the importance of links between the rivers, floodplain and estuaries in sustaining aquatic biodiversity across the region.

Research leader Professor Stuart Bunn, from Griffith University, says that annual monsoonal floods in the wet-dry tropics stimulate the production of high quality forms of food that sustain countless species of wildlife and fish and their habitats.



Field work is currently underway in Kakadu National Park and the Daly River (*Northern Australia Hub, National Environmental Research Program*).



Floodplains, like this one in Kakadu, are very important to aquatic food webs (*Northern Australia Hub, National Environmental Research Program*).

"These big wet season flows, and the connections between the main channel, estuary and floodplains, are vitally important to maintaining populations of barramundi, water birds, and other iconic species," Professor Bunn says.

"But some key questions remain about how these systems work. We are trying to determine if there are 'hotspots' of floodplain productivity, and whether this is an important food subsidy for species living in the river channel."

"Floodplains are very important to aquatic food webs, because it is here that small fish feed on microscopic plants and animals, later providing sustenance for larger species when they move to connected waterways and the coast."

"But we don't know how dependent large animals like predatory fish are on floodplains, how much animals move around, and whether longer periods of flooding can sustain larger populations and more species."

"We're working closely with Traditional Owners and park managers to undertake field work, including inserting tracking devices on larger fish to see just how far and where they travel, and how long they spend in different habitats."

"Understanding the importance of linkages between rivers, floodplains and estuaries will allow us to predict how natural and man-made changes to connectivity or flows could affect aquatic biodiversity – so any plans to reduce river flows or construct dams, for example, need to be considered very carefully."



The research team is investigating the dependence of large animals, like saltwater crocodiles, on floodplains (Northern Australia Hub, National Environmental Research Program).

More information about the research is available at www.nerpnorthern.edu.au/research/projects/31 or phone (08) 8946 7102.



Before the green and golden bell frog research area was built (*Boyd Carney*).

Volunteering – making wetlands research possible

**Grant Morgan, Volunteer Coordinator,
Hunter Wetlands Centre Australia**

Volunteers undertake some of the most effective data collection for research. For more than 27 years volunteers at the Hunter Wetlands and other sites have conducted regular counts of egret nests as part of a program known as Egret Watch. This ongoing monitoring and data collection provides invaluable data sets for researchers. It would be nearly impossible for an individual researcher alone to conduct these counts each year.

Volunteers have also been collecting vast amounts of data for the Waterwatch program. With 14 testing locations, a significant amount of data has been collected and added to other testing programs.

Volunteers assist researchers in more ways than just collecting data. Here at the Hunter Wetlands Centre we have been involved with the University of Newcastle on a project concerned with green and golden bell frogs and how to deal with the threat of chytrid fungus. Volunteers constructed several large frog ponds and regenerated the native bushland around the ponds. Much of the native flora was grown from seeds collected by volunteers and propagated in the volunteer run nursery. They have also provided ongoing maintenance of the ponds and assisted with reconfiguring research areas for different experiments.

Despite all the contributions that volunteers can provide to researchers they are an often underutilised resource. Those that do attempt to use volunteers often complain managing volunteers can be difficult. Training volunteers to do this valuable work is something that is often



The green and golden bell frog research area was built and is maintained by volunteers (*Paul Trute*).

overlooked in research planning and always suffers from a lack of funding.

There are many motivations for volunteers to participate in a project and they come from a diverse range of backgrounds. This makes the social interaction between the researcher and the volunteers invaluable. Sharing successes with volunteers is also important for researchers who use volunteers to support their research. The key to achieving quality research outcomes with volunteer involvement is simple: don't take

them for granted, keep them informed and include them throughout the process especially celebrating milestones and successes.

Grant Morgan is the Volunteer Coordinator at Hunter Wetlands Centre, a member of the Australasian Association of Managers of Volunteers, a doctoral student at the University of Newcastle, President of Newcastle University Postgraduate Student Association and the NSW Ramsar Managers Network Coordinator.


Researching the ecosystem impacts from acid sulfate soils in the Coorong and Lakes Alexandrina and Albert Wetland Ramsar site

Ann Marie Jolley and Liz Barnett, SA Department of Environment, Water and Natural Resources; Leigh Sullivan, Richard Bush and Nicholas Ward, Southern Cross Geoscience and Paul Shand, Commonwealth Scientific and Industrial Research Organisation

The millenium drought in the Murray-Darling Basin resulted in significantly reduced flows into South Australia, low water levels and the exposure of large areas of acid sulfate soils within Lakes Alexandrina and Albert. Environmental consequences included: dust storms, the formation of sulfuric materials and acid, sulfuric odours, mobilisation of toxic metals, poor water quality and ecological degradation. There was also a risk of lake-wide acidification of over 100 000 hectares if the majority of the acidity generated was transported from the sediments to the waterbody.



Acid sulphate soils at Boggy Lake in 2010 (*Liz Barnett, DEWNR*).



To better understand the impacts from prolonged exposure, oxidation and rewetting, acid sulfate soil research is being undertaken by CSIRO, Southern Cross Geoscience, the SA Environment Protection Authority and the Department of Environment, Water and Natural Resources in South Australia as part of the Murray Futures Coorong, Lower Lakes and Murray Mouth (CLLMM) Recovery Project. The research involves an ecosystem approach examining sediment, water, macroinvertebrates (such as mussel larvae and bugs), plant and some small bodied fish interactions to provide a deeper understanding of environmental connectivity and resilience.

Investigating the mobilisation and uptake of metals at the lower end of the food web and in different organisms is essential to assessing both present and future risk posed by acid sulfate soils to the ecological function and ecosystem services this wetland of international importance provides.

The findings from the research will be used to inform water level management and the restoration of wetland function. The information can also highlight the ecological consequences of drought and water over-allocation, and the benefits of avoiding degrading or unsustainable processes to ensure the wise use of the Murray-Darling Basin resources.

For more information about Acid Sulfate Soils Research Project contact **ann-marie.jolley@sa.gov.au**

The CLLMM Recovery Project is part of the South Australian Government's Murray Futures program, which is funded by the Australian Government's Water for the Future initiative.

The South Australian Government acknowledges Ngarrindjeri are the Traditional Owners of the land and that according to their traditions, customs and spiritual beliefs its lands and waters remain their traditional country.

Zooplankton in Lakes Alexandrina and Albert

Rebecca Quin and Adam Watt, SA Department of Environment, Water and Natural Resources and Russell Shiel, Ecology, Evolution and Landscape Sciences, University of Adelaide

Following exceptional rainfall in the northern Murray-Darling Basin in late 2010, floodwaters into the Lower Murray refilled Lakes Alexandrina and Albert (Lower Lakes). The Lower Lakes had previously been drying and salinising during extended drought conditions.

High volume flows from the 2010 floods triggered dynamic responses by zooplankton within the Lower Lakes. The unusually large flooding moved zooplankton assemblages down from the upper and middle reaches of both the Darling and Murray Rivers. This resulted in a suite of freshwater species being found beyond the barrages into the North Lagoon of the Coorong, and out to the Southern Ocean. Upstream (freshwater) assemblages displaced estuarine communities which had persisted through the extended drought period.

Following the high flows, unique opportunities existed to monitor responses of the zooplankton in the Lower Lakes. Sampling in 2010-11 by the South Australian Department of Environment, Water and Natural Resources (DEWNR) Coorong, Lower Lakes and Murray Mouth (CLLMM) Recovery Project, in collaboration with the University of Adelaide, established that riverine zooplankton species replaced the estuarine species recorded above the barrages in Lake Alexandrina and the Goolwa Channel. Riverine zooplankton was also dominant in Lake Albert after refilling, with some saline-tolerant species persisting in the southern areas of the

lake. The riverine species recorded originate from the Darling River or a northern tributary within the Murray-Darling Basin, with certain species previously known to occur only within the Darling system.

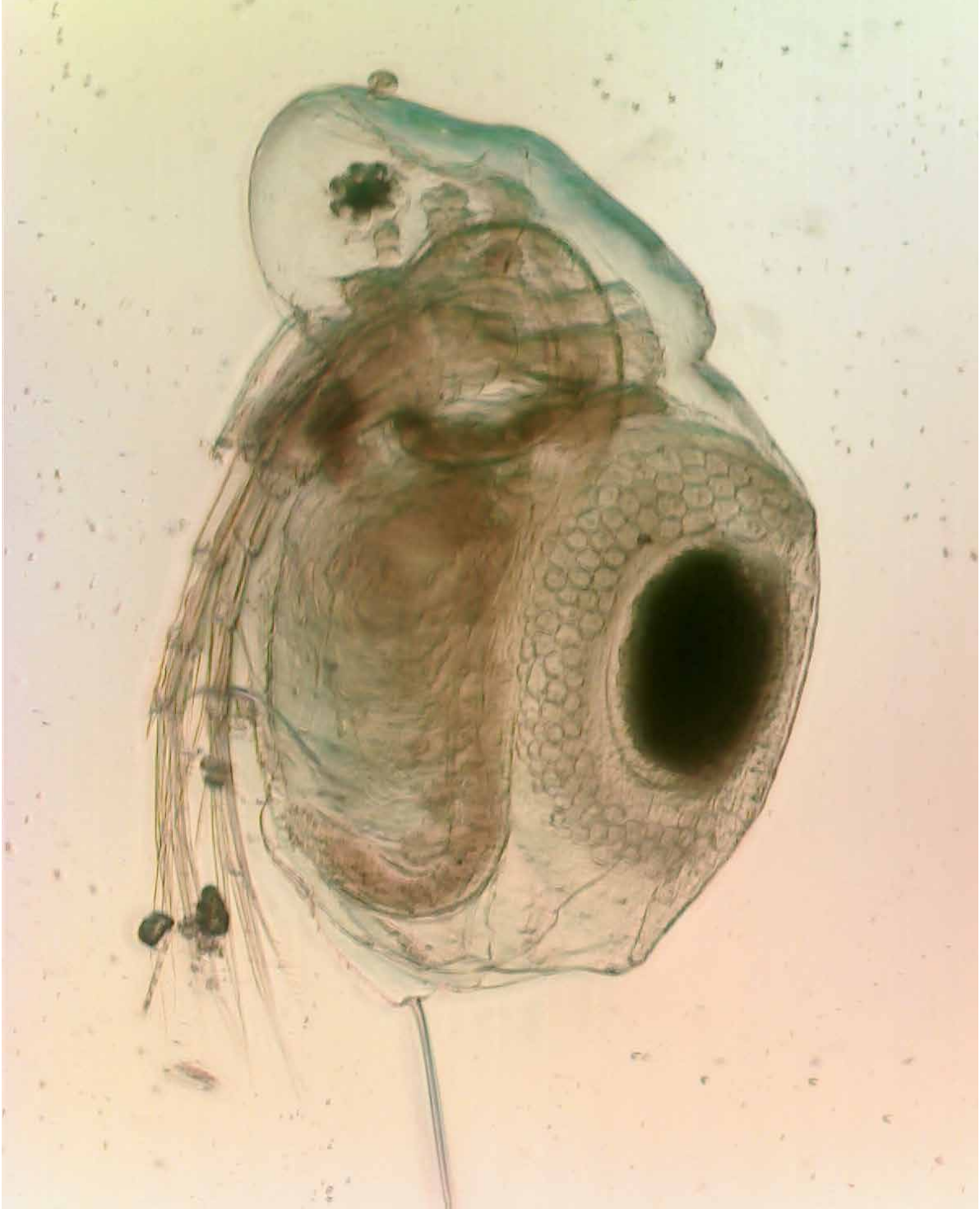
Continued monitoring of zooplankton within the Lower Lakes in 2011-12, found a persistence of riverine zooplankton, with most of the same species from the same source catchments as 2010-11. This reflects the extended persistence of riverine biota in the Lower Lakes and extended inundation of the margins of the Lower Lakes which has triggered local propagule emergence.

Monitoring of zooplankton in the Lower Lakes continues to provide valuable information about the health of the Lower Lakes, with zooplankton an indicator for changing conditions and an important lower order food source. The connectivity of the Lower Lakes with the broader Murray-Darling systems demonstrates zooplankton's role in functional connectivity within the system.

For more information about zooplankton contact **rebecca.quin@sa.gov.au**

The CLLMM Recovery Project is part of the South Australian Government's Murray Futures program, which is funded by the Australian Government's Water for the Future initiative.

The South Australian Government acknowledges Ngarrindjeri are the Traditional Owners of the land and that according to their traditions, customs and spiritual beliefs its lands and waters remain their traditional country.



Zooplankton, *Moina micrura* (Russel Shiel).



6th Lake Eyre Basin Conference, Port Augusta 17 – 19 September 2013

**Department of Sustainability, Environment,
Water, Population and Communities**

The 6th Lake Eyre Basin Biennial Conference provides an opportunity to exchange information and views for all who have an interest in the sustainable management of the Basin.

Oral presentations, landholder stories, poster displays, small group discussions and social gatherings will explore the theme, '*Basin voice: shared understanding and action for a sustainable LEB future - linking science and management*'. Keynote presentations will challenge participants to consider how we can use our knowledge of the Basin's water and associated natural resources to manage current and future opportunities and threats to this remarkable, inland river system.

A call for papers has drawn an impressive response from people eager to share their

knowledge, monitoring results, experiences, project outcomes and ideas. Presenters will address key issues, including extractive industries, visitor access and impact management, river and catchment health, climate change, regional NRM and adaptive management challenges, pest and weed management, protection of culturally significant sites and water resource development.

For program and registration information visit <http://www.lebmf.gov.au/conference/index.html>, or contact the Lake Eyre Basin Secretariat, (02) 6275 9348, emma.ross@environment.gov.au. Places may be limited by the size of the venue, so make sure you get in early!

With generous support from sponsors, we are able to offer limited assistance to independent student/ community members/LEB landholders (i.e. people not receiving support from an organisation or institution) to attend the event. Details are provided on the **on-line Registration Form**.



Birdlife alongside the Diamantina River in the Lake Eyre Basin (Paul Wainwright).

COMMUNITY ACTION



The Kungun Ngarrindjeri Yunnan Agreement (KNYA) translates to 'listen to Ngarrindjeri talking' (Gemma Cunningham).

KNYA – new relationships between Ngarrindjeri and the South Australian Government

Lachlan Sutherland, SA Department of Environment, Water and Natural Resources in conjunction with the Ngarrindjeri Regional Authority

The Department of Environment, Water and Natural Resources (DEWNR) in South Australia is partnering with the Ngarrindjeri Regional Authority (NRA) to implement the

Coorong, Lower Lakes and Murray Mouth (CLLMM) Recovery Project's, Ngarrindjeri Partnerships Project. This partnership continues the longstanding relationship between the Department and the Ngarrindjeri, the Traditional Owners, in the management of the CLLMM region.

In 2009 the South Australian Government and the NRA entered into the whole-of-government Kungun Ngarrindjeri Yunnan Agreement (KNYA). Translated to 'listen to Ngarrindjeri talking', the KNYA includes a commitment by the state to

work with the NRA to develop the Ngarrindjeri engagement strategy in the CLLMM Business Case and allocate resources to support Ngarrindjeri participation.

The Ngarrindjeri Partnerships Project was designed to implement the objectives of the 2006 Ngarrindjeri Yarluwar-Ruwe (Sea Country) Plan. Since implementation the project has enabled the NRA to forge new relationships with the State that pave the way for Ngarrindjeri to play a major role in the future management of the CLLMM region. The NRA with support from their Research, Policy and Planning Unit (NRA RPPU), based at Flinders University, have also been developing innovative arrangements to enable Ngarrindjeri values and philosophies to be integral to future CLLMM management strategies.

In an effort to better support Ngarrindjeri engagement in environmental and broader water resource planning DEWNR and the NRA held the KNYA Water Workshop in February 2013. The workshop brought together Ngarrindjeri, State Government water planners and policy makers, researchers, and representatives from the Commonwealth Environmental Water Office.

The workshop was a two way learning exercise that aimed to increase Ngarrindjeri understanding of water policy and planning frameworks as well as governments understanding of Ngarrindjeri interests in water. A range of opportunities to better accommodate Ngarrindjeri interests in current frameworks, including wetland management planning, were discussed. A follow up workshop is proposed for later in 2013 to re-imagine water planning processes that better accommodate Ngarrindjeri objectives, outcomes, values and uses as proposed by the Murray-Darling Basin Plan.



The Kungun Ngarrindjeri Yunnan Agreement Water Workshop was a two way learning exercise held in February 2013 by the Ngarrindjeri Regional Authority and DEWNR (Gemma Cunningham).

For more information about the Ngarrindjeri Partnerships Project contact **lachlan.sutherland@sa.gov.au**

The CLLMM Recovery Project is part of the South Australian Government's Murray Futures program, which is funded by the Australian Government's Water for the Future initiative.

The Ngarrindjeri people are the descendents of the original Indigenous inhabitants of the lands and waters of the Murray River, Lower Lakes and Coorong and adjacent areas. Ngarrindjeri have occupied, enjoyed, utilised and managed these traditional homelands since time immemorial.

The South Australian Government acknowledges Ngarrindjeri are the Traditional Owners of the land and that according to their traditions, customs and spiritual beliefs its lands and waters remain their traditional country. The State also acknowledges and respects the rights, interests and obligations of Ngarrindjeri to speak and care for their traditional country, lands and waters in accordance with their laws, customs, beliefs and traditions.



The Eleocharis shallows at this Wah Wah ground tank will be expanded using earthworks (*M. Herring*).

Win-win for wildlife and water

Matt Herring, Murray Wildlife Pty Ltd and Marion Benjamin and Kimberley Beattie, Murrumbidgee Landcare Inc.

In the Wah Wah district north of Hay, New South Wales, a new pipeline is set to boost water use efficiency. It will save an estimated 9000 megalitres for the environment each year. The Murrumbidgee Landcare 'Water for Wildlife' project recognises that saving water for the environment has to be carefully managed because nobody wants to rob Peter to pay Paul. To ensure that landholders are able to protect the wildlife they have valued on their properties over generations, our project is trialling options to compensate for the loss of local habitat associated with the pipeline.

Since the 1930s, many wildlife species have come to depend on Wah Wah's ground tanks, which look much like any farm dams. An extensive channel system feeds these tanks twice a year, and incorporates 51 large properties across the Wah Wah district. There are more than 600 ground tanks, supporting sheep and cattle grazing on the Hay Plain. The Australian Government has earmarked \$44 million to upgrade the old channels and ground tanks by replacing them with a state of the art pipeline and trough system. For wildlife, the landscape and their habitat is being transformed once again.

Landholders in the district have been concerned about the impacts on wildlife of such an enormous change in water management. The

Water for Wildlife project, with funding from Caring for Our Country brings together graziers, Landcarers, water users and irrigation experts to explore management options. More than a dozen landholders have offered land on their properties for demonstration sites. Works are underway using a range of different techniques to improve existing habitat and create new habitat as well.

A range of waterbirds, turtles, chats, bats, frogs and kangaroos are among the wildlife that Wah Wah's ground tanks currently support. For many common species like galahs and crested pigeons, the new troughs will suffice as an alternative to the ground tanks. But at least another 40 species will be left high and dry. Some of the more mobile ones might be able to find suitable unoccupied habitat elsewhere, many others may not. The white-fronted chat, a small black and white bird dependent on mudflats, is one species likely to suffer. Over the past 80 years, it has become a Wah Wah resident, rather than just a visitor to the plains when the wetlands have filled and the creeks are running. No mud will likely mean no chats.

Strategic earthworks and stock exclusion at already significant ground tanks will improve habitat by expanding shallows and waterplant coverage. Once the pipeline is constructed, we hope to arrange for small amounts of environmental water to be delivered to maintain these sites. Habitat creation will target threatened species like the Australasian bittern, Australian painted snipe and southern bell frog. Small garden ponds will ensure bush birds still have a place to drink, and infrastructure to facilitate the delivery of environmental water to some of the region's canegrass swamps could be of great benefit to wetland biodiversity.

A period of dramatic landscape transformation looms, and through Landcare, landholders of the Wah Wah district are proactively conserving their local wildlife and saving water at the same time.

Water for Wildlife is funded by Caring for Our Country. It is a multi-partner project including Murrumbidgee Landcare, Hay Trees on Plains Landcare, the Wah Wah Stock and Domestic Water Users Association, the Murrumbidgee CMA, and Murrumbidgee Irrigation. The trials are being led by ecologist Matt Herring of Murray Wildlife Pty Ltd.



Locals gather at a Landcare field day, determined not to see their Wah Wah wildlife left high and dry (K. Beattie).

Restoring Tuppal Creek—a community and government partnership

Emma Wilson, NSW Office of Environment and Heritage

Tuppal Creek is a 60 kilometre ephemeral system located in the southern Riverina between Tocumwal and Deniliquin New South Wales. The natural flow of the creek has been greatly modified and reduced by river regulation and changes to the landscape, which has resulted in the declined health of the creek.

Tuppal Creek remains highly valued by the local community and is considered an important ecological asset in the Murray Valley which

supports a range of fauna including several threatened species such as the superb parrot (*Polytelis swainsonii*).

An environmental water trial commenced in 2012—13 after the NSW Office of Environment and Heritage (OEH) and the Murray Catchment Management Authority (MCMA) were approached by the Tuppal Creek community who had concerns about the declining health of the system resulting from lack of flows and prolonged drought. A partnership was then formed between OEH, more than 25 landholders and community stakeholders, local councils, MCMA, the Commonwealth Environmental Water Office (CEWO) and Murray Irrigation Limited (MIL) to conduct the trial watering event.



Tuppal Creek prior to environmental flows, Artulla Crossing September 2012 (Emma Wilson).

The MIL irrigation delivery system was used to deliver almost 5000 megalitres of NSW and Commonwealth environmental water to Tuppal Creek in spring 2012 and autumn 2013. The trial project has achieved several positive outcomes including improved water quality in the system, frog breeding and recruitment and improved health of riparian vegetation. Furthermore, a recent fish survey, conducted by DPI Fisheries NSW, detected the native golden perch (*Macquaria ambigua ambigua*) in the creek.

The project has helped to develop a strong relationship between the community and government agencies. OEH will continue to develop and maintain this partnership with the Tuppal Creek community to achieve common objectives in the future.

A short video of the project can be viewed on the OEH website: <http://www.environment.nsw.gov.au/environmentalwater/envwatermurraylowerdarlingupdate.htm>



Tuppal Creek after environmental flows were delivered, Artulla Crossing October 2012 (Emma Wilson).



The Boondall Wetlands Environment Centre is celebrating the 20th anniversary of Moreton Bay Ramsar site in October 2013 with guided canoe tours, catchment clean-ups and all-ability art activities (*Bruce Gray*).

20th anniversary of Moreton Bay Ramsar site

Lisa Johnston, Boondall Wetlands Environment Centre, Brisbane City Council

This year marks the 20th anniversary of sister wetlands Moreton Bay and Yatsu Higata Tidal Flat of Narashino, Japan as being listed as Wetlands of International Importance.

As both sites were listed in 1993 and the same migratory shorebirds visit each wetland during their migration cycle, it has led to the Brisbane-Narashino Wetlands affiliation agreement.

The agreement embraces the idea of 'thinking globally and acting locally'. It is a shared initiative for the conservation of migratory shorebirds and their habitats and responds to increasing awareness of both cities and their citizens, regarding the conservation of wetlands areas.

To celebrate and continue to raise awareness, Brisbane City Council's Boondall Wetlands Environment Centre, located in Moreton Bay and Yatsu Higata Nature Observation Centre in Japan are hosting a number of community engagement activities during October 2013 to exchange wetland information. Japan is planning for 2000 people to encircle Yatsu Higata each holding a written message from wetlands around the world including Moreton Bay. The people of Brisbane are invited to join guided canoe tours, catchment clean-ups and all-ability art activities.

For more information please contact **BWEC@brisbane.qld.gov.au** or visit Boondall Wetlands Environment Centre's website **<http://www.brisbane.qld.gov.au/environment-waste/natural-environment/environment-centres/boondall-wetlands-environment-centre/narashino-agreement/index.htm>**



Cabbage Tree Bay Primary School Sticker Competition winning entry by Eliza Curll, Manly Village School (Manly Environment Centre).

Conserving Cabbage Tree Bay – community, co-operation, collaboration, communication

Judy Reizes, Manly Environment Centre


Eleven years after Cabbage Tree Bay's gazettal as Sydney's only accessible No-take Aquatic Reserve, there are ongoing problems with illegal fishing. A new volunteer group is helping local and state government agencies to protect the Bay's biodiversity from illegal fishing and other threats.

The creation of Manly's marine sanctuary is a reflection of the passion and commitment of its community dating back to the early 1990s and is the envy of many Sydneysiders. Key players already involved in protecting the Bay, like Dave Thomas from EcoDivers and marine scientist, Belinda Curley have joined with the Manly Environment Centre, Manly Council and NSW Fisheries to set up a Friends of Cabbage Tree Bay Volunteer Group.

This group was launched at Ocean Care Day in December 2012. Enthusiastic volunteers dedicate half a day per month on weekends to be at Cabbage Tree Bay, engendering a love of the Bay and educating visitors about the importance of its biodiversity and how to protect it, reporting infringements, etc. They provide a valuable backup for the stretched resources of Manly Council and NSW Fisheries.

A growing spirit of co-operation already exists, with local dive companies and tour groups getting involved in sharing information with the volunteers and attending events. Local businesses provide venues, staff and refreshments for volunteer training days and enrichment sessions.

The long-term research by the staff and students of five universities on the Bay's marine life is shared with the volunteers through their training and their volunteer manual. Staff from National Parks and NSW Fisheries also contribute to the training material.



Volunteers set up a blackboard each weekend by the boat ramp so that divers coming out of the water can share that day's visual "catch" with other visitors. If you want to see the hundreds of marine creatures both big and small, check out the eight pages of Cabbage Tree Bay videos on YouTube or the six high quality videos from Manly's Bold and Beautiful Swimmers'. They swim there early each morning with everything from visiting whales and dolphins, dusky whaler sharks and a resident turtle.

Not only is it a marine wonderland but every now and then an echidna will stroll down the stairs and meander across the beach ignoring the Sunday crowd, while large eastern water dragons sunbake on the rocks, protected little penguins startle board riders by skimming the surface after schools of tiny fish and after dark long-nosed bandicoots hang about the barbecues.

And last but not least, hundreds of primary school children shared their ideas of how to discourage illegal fishing in the recent Cabbage Tree Bay sticker competition.

For further information visit
<http://www.mec.org.au/projects/cabbage-tree-bay>

Australian Wetland Network – engaging NGOs in conservation and wise use of wetlands

Louise Duff, Australian Wetland Network


The Australian Wetland Network (AWN) was established in 1994 by Non Government Organisations (NGOs) to support and promote non-government contributions to the Ramsar Convention.

The Ramsar Convention is an intergovernmental treaty that facilitates national action and international cooperation for the conservation and wise use of wetlands. The treaty was adopted in the Iranian city of Ramsar in 1971. Australia is one of 167 member countries, and there are now more than 2100 Ramsar-listed wetlands covering all geographic regions of the planet.

Members of the Ramsar Convention formally recognised the key role NGOs play in promoting conservation and wise use of wetlands at the fifth Conference of Contracting Parties held in



AWN Secretary Louise Duff and Phil Straw attended a site inspection of Towra Point Ramsar Site with representatives from the Australian Government Department of Sustainability, Environment, Water, Population and Communities (*WetlandCare Australia*).



Japan in 1993. At that Conference, member countries recommended that:

- contracting Parties strongly support and give particular attention to the development and functioning of national and international NGOs that aim for conservation and wise use of wetlands and
- contracting Parties consult NGOs, provide them with relevant information and offer them ample opportunities to contribute to the formulation and implementation of governmental wetland policy.

The AWN recently reviewed our network and now have 30 members, representing peak and national NGOs, state bodies, regional and local groups around the country. AWN members are active in wetland policy, advocacy, management, conservation and education.

The first activity for our new members was to participate in a consultation process with peak national bodies held by the Australian Government to provide input to the development of a National Wetland Policy. AWN's secretary submitted a combined response to a consultation questionnaire that presented our network members' views on key values, threats and issue facing wetlands that the national policy should address. AWN's Secretary, Louise Duff from WetlandCare Australia, and three members of the Technical Reference Group attended the consultation workshop: Christine Prietto from

Hunter Wetlands Centre, Doug Watkins from Wetlands International-Oceania, and Phil Straw from the Australasian Wader Studies Group. We also recently developed a Strategic Plan to guide our actions for the next two years.

The Australian Wetland Network thanks Hunter-Central Rivers Catchment Management Authority and the NSW Environmental Trust for their financial assistance in 2012-13.

New NGO members are most welcome to join our network. All recent documents including a fact sheet about AWN, a membership list, notes from the NSW Forum, our submission to the National Wetlands Policy and our strategic plan can be found on our web page. To find out more, visit <http://www.wetlandcare.com.au/index.php/our-work/current-projects/australian-wetland-alliance/>

Anstey-Keane Dampland—a Bush Forever Site and part of Jandakot Regional Park, WA

Bryony Fremlin, Friends of Forrestdale

In Perth's south-eastern suburb of Forrestdale is a rare and fragile nature reserve known as Anstey-Keane Dampland – a 311 hectare oasis of heathland, dampland and banksia woodland surrounded by ever-encroaching housing and industrial development. Anstey-Keane's diverse habitats support a rich and unique variety of plant and animal species, and accordingly, is the most significant dampland on the Swan Coastal Plain.

Anstey-Keane Dampland is one of Western Australia's Bush Forever sites (<http://www.planning.wa.gov.au/publications/5911.asp>), which are representative regional ecosystems and habitats that play a central role in Perth's biodiversity. The site is also part of Jandakot Regional Park.



Friends of Forrestdale volunteers removing rubbish from Anstey-Keane Dampland (Bryony Fremlin).

Qualities

Anstey-Keane Dampland has many special qualities:

- It is one of the last intact large nature reserves in the Perth region.
- It is one of the last remaining examples of a now threatened flora community once common throughout the Swan Coastal Plain.
- It has over 35 species of plants listed under WA law as being either priority species, end of range, or declared rare flora.
- It is home to end of range fauna species including Rosenberg's monitor (*Varanus rosenbergi*).
- Anstey-Keane is the only known location of the megamouth bee (*Leioproctus muelleri*), a unique ground-nesting species of solitary bee, which until its discovery there in 2010 was unknown to science.
- With over 380 flora species, Anstey-Keane is the most floristically rich part of the Jandakot Regional Park and second most floristically rich Bush Forever site on the SCP.
- It contains two of Western Australia's threatened ecological communities: shrublands on dry clayflats (endangered), and herb-rich shrublands in clay pans (vulnerable).
- Over 75 per cent of Anstey-Keane's vegetation is in excellent to pristine condition.

Tenure

Anstey-Keane has complex tenure: five government agencies (chiefly the Department of Environment and Conservation), and City of Armadale all have a part to play in its management and protection.



Shrubs on clay flats, Anstey Keane Dampland (*Bryony Fremlin*)

Volunteering

The Friends of Forrestdale - a voluntary group of around twelve members - plays an active role in the care of Anstey-Keane Dampland. Their activities include weed and rubbish removal and fence repair, as well as alerting relevant authorities to environmental damage caused by off-road vehicles and rubbish dumping.

Threats

Anstey-Keane faces a number of threats:

- a proposed road that will fragment the reserve and lead to multiple ongoing degradation processes
- invasive weed species in certain areas of the reserve - most serious of which are cape tulip, pigface and love grass
- unlawful use of off-road vehicles causing noise pollution, degradation and spread of phytrophthora dieback
- rubbish dumping causing visual and environmental pollution and degradation
- fire.

Ongoing Protection

Large areas of Anstey-Keane Dampland were once earmarked for industry. It was through awareness of the conservation values of the area by concerned community members (and enlightened government ministers of the day) that this precious reserve was saved.

Few large intact metropolitan reserves exist today of the quality and richness of biodiversity of Anstey-Keane Dampland. It is therefore crucial that we value and protect this reserve and ones like it, for the benefit not only of the environment but present and future generations.

For further information please contact Rod Giblett, Secretary, Friends of Forrestdale (FoF): (08) 93972874 r.giblett@ecu.edu.au or David James, President, FoF: (08)93970276

Everyone's Environment grants promote environmental improvement in Queensland

Everyone's Environment Grants Queensland

Queensland is home to many distinctive ecosystems including coastal and marine areas, Ramsar Wetlands, World Heritage and many other ecologically significant sites. Queensland's Department of Environment and Heritage Protection is funding communities to implement practical actions to clean up their local environment.

The Queensland Government's Everyone's Environment grants program provides community groups with funding assistance from \$2000 to \$100 000 to tackle environmental degradation in their area.

Last year, 74 organisations received a share of \$3 million under Round One of the program to deliver a broad range of initiatives including waterway and wetland restoration projects.

Wongaloo wetlands near Townsville, sits adjacent to Bowling Green Bay, a significant Ramsar site. Funding recipient, the Wetlands and Grassland Foundation, is using their grant funding to remove the weeds lantana, pink bauhinia and candle bush from over 50 hectares of the Wongaloo site. Three kilometres of fencing will also be erected to help manage stock and control weeds in the future.

With \$12 million of funding over three years, grants are available under the program for hands-on environmental initiatives such as:

- community clean-up activities



Exotic tree removal from rainforest fringe at Wongaloo Wetland near Townsville (*Mark Stoneman*).



Late in the 2013 wet season at Flathole, Wongaloo Wetland, Townsville (Mark Stoneman).

- restoration of wetlands, coastal dunes and river or stream banks, including clean-up, reinstatement of natural hydrology, fencing of riparian areas, revegetation and halting degrading processes
- water quality improvement in rural and urban areas through erosion control, sediment trapping and runoff reduction
- pest control and eradication
- threatened and priority species habitat restoration, rehabilitation and revegetation
- tree planting
- weed control
- water quality monitoring.

Round Two of the program has recently been announced and aims to support projects that help protect the environment against future extreme weather events.

Round Three of the grants program will be announced in 2014 and will offer \$5 million for suitable projects.

A wide range of community groups are eligible for the grants. For more information see the Everyone's Environment grants website (<http://www.ehp.qld.gov.au/funding/everyones-environment/index.html>).

