



**Australian Government**

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

# **Wetlands Australia**

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## **Monitoring and Research**

Other chapters can be downloaded from:

<http://www.environment.gov.au/water/publications/environmental/wetlands/wetlands-australia/wa23.html>

# 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.

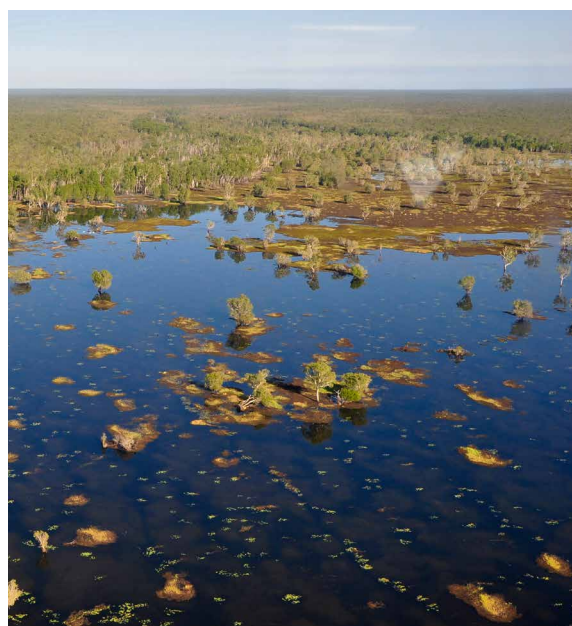
The team aims to quantify which areas are hot spots of food and energy production by measuring microscopic algal growth on floodplains, collecting small tissue samples from fish and other aquatic wildlife, and using remote sensing techniques to assess flooding patterns.

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](http://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](mailto: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](mailto:rebecca.quin@sa.gov.au)**

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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](mailto: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).