Australian Government

Water for the Future

Commonwealth Environmental Water
2008-09 Outcomes Report

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Further information about the Australian Government's environmental watering program can be found at <http://www.environment.gov.au/water>.

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Introduction

The first use of the Commonwealth's environmental water in the Murray-Darling Basin occurred in March 2009. During the 2008–09 year, in cooperation with our delivery partners, we provided water to ten wetlands and floodplains in three Murray-Darling Basin states. 10.9 gigalitres of Commonwealth environmental water was used at these sites. Approximately 4 gigalitres was also contributed to these sites by other sources including the states and territories or through *The Living Murray* program.

The provision of water to the environment represents an important achievement in the implementation of the Australian Government's *Water for the Future* initiative. Commonwealth environmental water that has been acquired through *Water for the Future* programs is being managed with the aim of achieving maximum environmental outcomes. Delivery of the water to the environment is occurring with strong cooperation between governments and other organisations, catchment management authorities and community groups.

This report has been prepared to provide information on the preliminary outcomes of environmental watering during 2008–09. As we are still very early in the process, a more complete picture of environmental outcomes will take more time to emerge. During this first year, the volumes of water provided and the sites selected for water were relatively small in scale, reflecting the prevailing drought conditions and the beginning of the water acquisition programs. Nevertheless, watering has already provided clear benefits to several important environmental assets.

Although the program is at a very early stage, monitoring programs have already detected encouraging changes such as improving tree health, decreasing salinity and benefit to populations of rare and endangered species.

In the coming years, the Commonwealth's environmental water holdings will grow substantially. This will give us an increased range of watering options and a much greater capacity to protect or restore environmental assets and improve overall ecosystem health. We will report regularly on the outcomes of the use of this water.

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Commonwealth Environmental Water

The position of Commonwealth Environmental Water Holder was established by the *Water Act 2007* to manage the Commonwealth's portfolio of environmental water entitlements. The objective is to protect or restore environmental assets of the Murray-Darling Basin, and other areas outside the Murray-Darling Basin where the Commonwealth holds water, to give effect to relevant international agreements.

Water that is held in the Murray-Darling Basin is required to be managed in accordance with the environmental watering plan that will be developed by the Murray-Darling Basin Authority. The water holdings consist of water entitlements purchased through the market or acquired through water savings due to infrastructure improvements.

The water entitlements being acquired by the Commonwealth retain their existing characteristics. This means that the Commonwealth is subject to the same rules, restrictions and fees as other holders of the same kind of title. The amount of water available for use therefore depends on the water entitlements acquired, and on seasonal water allocations.

The environmental watering plan will be part of the Murray-Darling Basin plan and will be developed in consultation with state governments and stakeholders.

Selecting sites for environmental watering

The Commonwealth Environmental Water Holder selected sites to receive environmental water based on proposals put forward by South Australia, Victoria and New South Wales. Advice on watering proposals was also provided by the Environmental Water Scientific Advisory Committee. This committee is a panel of scientific experts appointed to advise on the use of environmental water. It comprises eminent scientists and experts in fields such as hydrology, limnology, river operations management, river and floodplain ecology, and the management of aquatic ecosystems. More information is available at <http://www.environment.gov.au/water/policy-programs/cewh/committee.html>.

The objectives of the Commonwealth's environmental watering program depend on the prevailing climatic conditions. For example, in dry years the program will aim to ensure ecological capacity for recovery, while in wet years the program will aim to improve and extend healthy and resilient aquatic ecosystems. The 2008–09 year was extremely dry, so the primary objectives of the environmental watering program were to:

- avoid critical loss of threatened species
- avoid irretrievable damage or catastrophic events
- provide drought refuges to allow re-colonisation following the drought.

Further information on these objectives can be found in 'A Framework for Determining Commonwealth Environmental Watering Actions' at <http://www.environment.gov.au/water/publications/action/cewh-framework.html>.

Assessment criteria, developed in consultation with Murray-Darling Basin jurisdictions and the Environmental Water Scientific Advisory Committee, were used to determine which sites should be given priority. Key aspects of the assessment criteria were:

- the ecological significance of the asset to be watered, including the known presence of nationally threatened species

- the expected ecological outcomes from the use of the water, including an assessment of the current health of the asset and the likely response to watering
- a risk assessment that encompassed the likelihood and significance of negative outcomes from the watering, as well as the potential negative outcomes of not watering
- the cost effectiveness of the watering action, including an assessment of the contribution to the action by our delivery partners (e.g. financial, monitoring, management and water volume), and considering transmission losses and overall delivery costs.

The following ten sites were selected for watering in the 2008–09 year:

- Chowilla Floodplain (South Australia)
- Carpark Lagoons, Katarapko Floodplain (South Australia)
- Paiwalla Wetland (South Australia)
- Rocky Gully (South Australia)
- Markaranka Floodplain (South Australia)
- Overland Corner (South Australia)
- Murbpook Lagoon (South Australia)
- Lindsay Island (Victoria)
- Hattah Lakes (Victoria)
- Backwater Lagoon (New South Wales).

Location map: Commonwealth environmental watering events, 2008–09

Delivering and monitoring environmental watering

For each site, the relevant state department or Catchment Management Authority managed the delivery of the Commonwealth environmental water. These agencies are also monitoring the ecological responses and have reported to the Commonwealth on the preliminary outcomes of the watering. The full ecological benefit of environmental watering may take years or decades to emerge, so further environmental benefits are expected over time.

More information on the 2008–09 year environmental watering program and the Commonwealth Environmental Water Holder can be found at <http://www.environment.gov.au/water/policy-programs/cewh/index.html>.


Northern Territory
Queensland
Western Australia
South Australia
New South Wales
Australian Capital Territory
Victoria
Tasmania
Overland Corner Floodplain
Chowilla Floodplain
Markaranka Floodplain
Murbpook Lagoon
Carpark Lagoons on Katarapko Floodplain
Rocky Gully
Paiwalla Wetland

South Australia

Seven sites in South Australia received water from the Commonwealth environmental water holdings; these sites were:

- Chowilla Floodplain
- Carpark Lagoons on the Katarapko Floodplain
- Paiwalla Wetland
- Rocky Gully
- Markaranka Floodplain
- Overland Corner Floodplain
- Murbpook Lagoon.

The South Australian Murray-Darling Basin Natural Resources Management Board established a program to monitor groundwater, surface water and tree health in the areas that received environmental water. The program also counts the numbers of fish, frogs and birds at the watering sites, and monitors changes to the vegetation by taking photos.

Chowilla Floodplain

Carpark Lagoons on the Katarapko Floodplain

Paiwalla Wetland

Rocky Gully

Markaranka Floodplain

Overland Corner Floodplain

Murbpook Lagoon

Site 1: **Chowilla Floodplain**

'The watering program aimed to maintain the river red gums, understorey vegetation and a number of frog and waterbird species'

Background

The Chowilla Floodplain is located on the border of South Australia and New South Wales, north of Renmark. The area comprises large areas of river red gum (*Eucalyptus camaldulensis*) and black box (*Eucalyptus largiflorens*) woodland, and diverse wetland habitats. Many mature river red gums have died and the ecological health of the area has declined, due to the drought and the reduced flows down the River Murray. Saline groundwater and reduced soil moisture threaten the remaining river red gums and the understorey vegetation. If these trees die, many species of animals will lose their habitats.

The Chowilla Floodplain is part of the Riverland Ramsar Site, which is designated as a Wetland of International Importance under the Ramsar Convention (an intergovernmental treaty for conserving wetlands and their resources). It is also an icon site of *The Living Murray* program.

The Living Murray program is a partnership of the Australian Government and the governments of New South Wales, Victoria, South Australia and the Australian Capital Territory. Established in 2002, *The Living Murray* program aims to maintain the environmental health of six icon sites along the River Murray. These icon sites are:

- Barmah–Millewa Forest
- Gunbower–Koondrook–Perricoota Forest
- Hattah Lakes
- the Chowilla Floodplain and Lindsay–Wallpolla Islands
- the Lower Lakes, Coorong and Murray Mouth
- the River Murray Channel.

Further information about *The Living Murray* program is available at <http://www.mdba.gov.au/programs/tlm>.

Aims

Several wetlands across the Chowilla Floodplain received environmental water in the 2008–09 year. The watering program aimed to maintain the river red gums and understorey vegetation, and to maintain habitat for a number of frog and waterbird species.

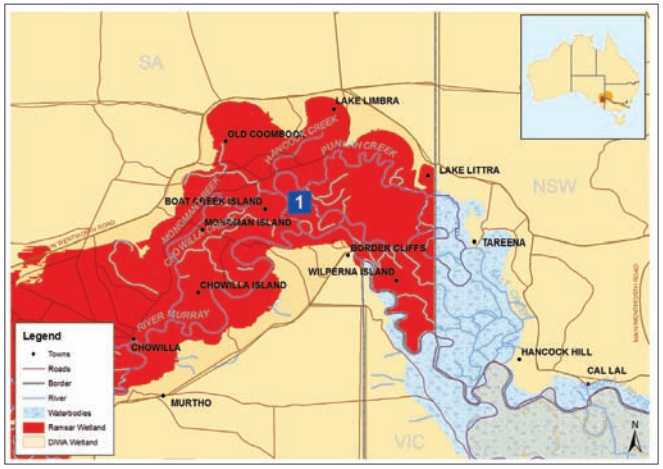
Outcomes

Shrubs like lignum (*Muehlenbeckia florulenta*) respond well to water in autumn; these understorey plants provide important habitat for frogs. Eight species of frogs are found on the Chowilla Floodplain, and seven of these species were found during surveys of watering sites. These species included the southern bell frog (*Litoria raniformis*), which is listed as 'vulnerable' under the *Environment Protection and Biodiversity Conservation Act 1999*.

Environmental watering — Chowilla Floodplain, 2008–09

Location	Environmental watering volume (megalitres)[1]	Delivery start date	Delivery finish date
Slaney Billabong	86	24 March 2009	8 April 2009
Lock 6 Depression	20	22 March 2009	30 June 2009
Brandy Bottle Waterhole	90	26 March 2009	13 June 2009
Chowilla Horseshoe	90	26 March 2009	5 April 2009
Gum Flat	1500	5 May 2009	30 June 2009
Total	**1786**		

[1] 1 megalitre = 1 million litres, 1 gigalitre = 1000 megalitres



Location map: Chowilla Floodplain

Site 1: **Chowilla Floodplain continued**

Surveys of waterbirds at Gum Flat, Brandy Bottle Waterhole, Slaney Billabong and Lock 6 Depression found that the additional water in the wetlands provided waterbirds a refuge from the drought and improved foraging opportunities for birds of prey.

The monitoring program also looked at the condition of tree species — including river red gum, black box and coobah *(Acacia stenophylla)* — at several locations across the Chowilla Floodplain. Most sites showed little change at this early stage — this is consistent with responses under other environmental watering programs, as tree health can be slow to improve when recovering from severe stress. The monitoring program will continue to monitor tree health in these areas.

Southern bell frog

The southern bell frog, also known as the growling grass frog, is one of the largest native frog species in Australia and is listed as 'vulnerable' under the *Environment Protection and Biodiversity Conservation Act 1999*. The habitat of the southern bell frog has become fragmented and degraded, in part due to altered flooding regimes. In some areas, the southern bell frog has become extinct; these extinctions have coincided with reduced flood frequency.

The *Environment Protection and Biodiversity Conservation Act 1999* recognises listed threatened species and ecological communities as matters of national environmental significance. A complete list of nationally listed species is available at <http://www.environment.gov.au/epbc/about/lists.html#species>.

The Act also recognises the migratory species listed in the:

- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
- China–Australia Migratory Bird Agreement
- Japan–Australia Migratory Bird Agreement
- Republic of Korea –Australia Migratory Bird Agreement.

Site 2: **Carpark Lagoons, Katarapko Floodplain**

'Since May 2009, 773 birds from 16 different species have been observed at the site, and the monthly surveys of waterbirds have also observed some species breeding'

Background

The Carpark Lagoons are located on the Katarapko Floodplain, in the River Murray National Park, near Berri. The site has diverse floodplain and wetland habitats, supporting a large number of species.

The Carpark Lagoons are also the site of a river rehabilitation project called Katfish Reach. This is a collaborative project between the Murray-Darling Basin Authority, the local community and South Australian government agencies.

Aims

The Carpark Lagoons contain stands of living mature river red gums. The primary aim of the environmental watering at this site was to maintain the health of these trees.

Outcomes

The monitoring program observed an improvement in overall tree health and abundant growth of aquatic plants such as water milfoil (*Myriophyllum papillosum*). Since May 2009, 773 birds from 16 different species have been observed at the site, and the monthly surveys of waterbirds have also observed some species breeding.

Environmental watering — Carpark Lagoons, Katarapko Floodplain, 2008–09

Location	Environmental watering volume (megalitres)	Delivery start date	Delivery finish date
Carpark Lagoons/ Katarapko Floodplain	200	24 March 2009	3 April 2009

Location map: Carpark Lagoons, Katarapko Floodplain

Site 3: **Paiwalla Wetland**

'diversity, abundance and health of vegetation in the area has improved significantly'

Background

Paiwalla Wetland is located near Murray Bridge, between Lock 1 and Wellington. The wetland provides a refuge during drought for species such as frogs and waterbirds. The area used to be a dairy property, but over the past 10 years a local community group, Wetland Habitats Trust, has owned and managed the wetland, working to restore its environmental values. Environmental watering will play an important role in the continued restoration of the area.

Aims

Reduced flows down the River Murray and the falling water level of the river mean that there are fewer habitats available for birds, fish, frogs and other river wildlife, especially below Lock 1. Therefore, Paiwalla Wetland has become an important refuge for many species. The environmental watering program aimed to protect this area by improving the water quality.

Paiwalla Wetland supports small-bodied native fish, including the flathead gudgeon (*Philypnodon grandiceps*). This species is common throughout the lower Murray and is an important source of food for higher predators such as birds, turtles and other fish.

At least 23 species of waterbirds use Paiwalla Wetland. It is also a nesting ground for the broad-shelled turtle *(Chelodina expansa)*, which lays its eggs in the wetland fringes in autumn. The broad-shelled turtle is a threatened species in South Australia.

Outcomes

The monitoring program found that water quality improved after the environmental watering, with reduced salinity (the amount of dissolved salts in the water) and turbidity (cloudiness of the water due to suspended and dissolved particles).

Although it is still very early in the program, reporting has indicated that waterbirds, frogs and small-bodied native fish have responded well to environmental watering. After watering, 26 waterbird species were observed in the area, including six species listed as 'significant' in South Australia. The size of the frog population also increased — six frog species and abundant tadpoles were seen during monitoring.

Since a previous environmental watering project in February 2008, the diversity, abundance and health of vegetation in the area have improved significantly. A key target of the Paiwalla Wetland management plan is establishing more aquatic plants such as water milfoil. Now, for the first time since its initial environmental watering in 2003, Paiwalla Wetland has extensive beds of aquatic plants.

Environmental watering — Paiwalla Wetlands, 2008–09

Location	Environmental watering volume (megalitres)	Delivery start date	Delivery finish date
Paiwalla Wetland	606	25 March 2009	22 June 2009

Location map: Paiwalla Wetland

Site 4: **Rocky Gully**

‘It is also an important habitat for waterbirds, frogs and macroinvertebrates.’

Background

Rocky Gully is in the Mannum–Wellington region of the River Murray. It is one of the last remaining sites in the Murray-Darling Basin for Murray hardyhead (*Craterocephalus fluviatilis*), a species listed as ‘vulnerable’ under the *Environment Protection and Biodiversity Conservation Act 1999*. Rocky Gully has been identified as a high-priority site for managing Murray hardyhead and other threatened native freshwater fish species, because it provides a habitat that is unique in the region. It is also an important habitat for waterbirds, frogs and macroinvertebrates.

Aims

The site received a Commonwealth environmental water allocation to help maintain the wetland, and the fish and wildlife populations that it supports.

In particular, the environmental watering aimed to improve the habitat of Murray hardyhead. This was to be done by reducing salinity levels to a level that the species can tolerate and by increasing the water level in Rocky Gully. The reduced salinity and increased water levels would also improve the health of vegetation growing around the edge of the wetlands, an important habitat for Murray hardyhead.

Outcomes

The environmental watering decreased salinity levels in the surface water of the wetlands to a level that Murray hardyhead can tolerate. This improved environment meant that the fish could breed during the pre-spring breeding season. Further monitoring will confirm how many species benefited from the environmental watering, and whether their populations increased.

The monitoring program also observed that the vegetation around the edge of the wetland was healthier and more abundant after the watering.

Large areas of plants including samphires and paspalum were covered in water after the environmental watering and rainfall. These species provided important habitat for fish, including the Murray hardyhead.

Murray hardyhead

The Murray hardyhead (*Craterocephalus fluviatilis*) is a small native fish, which is listed as ‘vulnerable’ under the *Environment Protection and Biodiversity Conservation Act 1999*. It was once widespread and common throughout the lower Murray-Darling River system in South Australia, Victoria and New South Wales. Now it survives only in a few isolated locations in Victoria and South Australia. Rising salinity and declining water levels threaten these remaining locations.

Environmental watering — Rocky Gully, 2008–09

Location	Environmental watering volume (megalitres)	Delivery start date	Delivery finish date
Rocky Gully	11	3 April 2009	4 April 2009

Location map: Rocky Gully

'the monitoring program also observed that the vegetation around the edge of the wetland was healthier'

Site 5: **Markaranka Floodplain**

'species of birds have been observed including musk and freckled ducks, and regent parrots'

Background

The Markaranka Floodplain is situated on the River Murray, near Waikerie in South Australia. Mature river red gum trees surround the Markaranka wetlands, providing important habitat for birds, lizards and mammals.

Aims

Environmental watering at this site aimed to avoid the irretrievable loss of stands of river red gum and to provide refuge during drought for wetland species including:

- the southern bell frog and regent parrot (*Polytelis anthopeplus*), which are listed as 'vulnerable' under the *Environment Protection and Biodiversity Conservation Act 1999*
- water-dependent bird species, including the freckled duck (*Stictonetta naevosa*), blue-billed duck (*Oxyura australis*) and musk duck (*Biziura lobata*), which are threatened species under South Australia's *National Parks and Wildlife Act 1972*.

The river red gum trees at Markaranka showed signs of stress from the drought; without flooding many of these trees could eventually die. The drought is also affecting other vegetation, including wetland plants.

Outcomes

Monitoring after the 2008–09 environmental watering recorded at least three frog species at the site. The monitoring program observed large numbers of spotted grass frogs (*Limnodynastes tasmaniensis*) and eastern sign-bearing froglets (*Crinia parinsignifera*). The long-thumbed frog (*Limnodynastes fletcheri*) was observed in the area for the first time.

The watering has prompted regeneration and flowering of lignum; this species provides excellent habitat for wildlife including the southern bell frog.

River red gums

River red gum forests and woodlands grow next to river channels in the Murray-Darling Basin and provide important habitat for a wide range of animals. Tree hollows are used for nesting, flowers are used for food, and fallen dead branches provide habitat for animals and fish. River red gums require flooding to survive — changes in flooding volume and frequency are altering where river red gums grow in the Murray-Darling Basin.

Seventeen species of birds have been observed at the site following environmental watering including musk, blue-billed and freckled ducks, and regent parrots.

Environmental watering — Markaranka Floodplain, 2008–09

Location	Environmental watering volume (megalitres)	Delivery start date	Delivery finish date
Markaranka Floodplain	2236	13 May 2009	23 June 2009

Location map: Markaranka Floodplain

Site 6: **Overland Corner**

‘the water was also expected to create a refuge during drought’

Background

Overland Corner is situated on the River Murray Floodplain near Kingston-on-Murray. The area contains large stands of river red gum, and is known to support threatened species such as the regent parrot and southern bell frog. Overland Corner also supports the great egret *(Ardea alba)*, a migratory species listed under the *Environment Protection and Biodiversity Conservation Act 1999* and the China–Australia Migratory Bird Agreement.

Aims

The environmental watering program aimed to prevent permanent environmental damage in the area, such as significant loss of mature river red gums and other vegetation that depends on flooding. The water was also expected to create a refuge during drought and to help prevent salinisation of the wetland.

Outcomes

Frog surveys undertaken at Overland Corner following the environmental watering recorded six frog species, including large numbers of southern bell frogs. Monitoring indicates that the inundation of the temporary wetlands by the environmental watering was important for triggering frog mating and breeding.

Other frog species recorded on the floodplain were the eastern sign-bearing froglet, eastern banjo frog (*Limnodynastes dumerili*), spotted grass frog, painted frog (*Neobatrachus pictus*), Peron’s tree frog (*Litoria peronii*), and the long-thumbed frog.

Since the watering, vegetation has regenerated significantly (including the river red gums), providing excellent habitat for wetland animals such as frogs and ducks. Monitoring has identified a dense growth of native water milfoil, which provides habitat and food for a range of animals, and new growth of lignum, a preferred habitat plant for southern bell frogs.

‘The watering was absolutely vital for health of the wetland. There has been a tremendous response in the red gums and the amount of foliage that has grown, and some of these gums are 100–200 years old. We’ve seen a lot of waterbirds and waders. At one time there were 60 mountain ducks (Australian shelducks) on the wetland. There have also been wood ducks, teals and pink-eared ducks (which are listed species) nesting on the edge of the lagoon in the lignum. We have also seen an explosion in the frog population following the watering, with abundant tadpoles and frogs.’

Ron Boyce, President, Overland Corner Branch of the National Trust of South Australia

Environmental watering — Overland Corner, 2008–09

Location	Environmental watering volume (megalitres)	Delivery start date	Delivery finish date
Overland Corner	500	31 May 2009	24 June 2009

Location map: Overland Corner

Site 7: **Murbpook Lagoon**

'A number of waterbird species have been recorded at the wetland since the watering, including the Australian shelduck, black swan and musk and blue-billed ducks.'

Background

Murbpook Lagoon is located between Locks 1 and 2 on the River Murray, approximately 17 kilometres north of Blanchetown. The area contains large areas of river red gums and a number of significant species such as the southern bell frog, Australian shoveler (*Anas rhynchotis*) and the regent parrot.

Aims

The watering aimed to maintain the health of species such as the river red gums and coobah, and halt further salinisation of the wetland bed.

Outcomes

Water quality and groundwater monitoring found that prior to watering groundwater was flowing towards the wetland, increasing the risk of salinisation of the wetland bed. Following the watering, the salinity gradients are moving away from the wetland bed towards the river and salinity levels in the wetland have reduced.

A number of waterbird species have been recorded at the wetland since the watering, including the Australian shelduck (*Tadorna tadornoides*), Australian shoveler, black swan (*Cygnus atratus*), and musk and blue-billed ducks.

Spotted grass frogs and eastern sign-bearing froglets have been recorded in large numbers since the watering. Eastern banjo frogs and southern bell frog calls were also recorded.

Environmental watering — Murbpook Lagoon, 2008–09

	Environmental watering volume (megalitres)	Delivery start date	Delivery finish date
Murbpook Lagoon	1400	19 June 2009	29 June 2009

Location map: Murbpook Lagoon


Northern Territory
Queensland
Western Australia
South Australia
Lindsay Island
Hattah Lakes
New South Wales
Victoria

Victoria

Two sites in Victoria received water from the Commonwealth environmental water holdings; these sites were:

- Lindsay Island
- Hattah Lakes.

The delivery of environmental water to these sites was a cooperative effort between the Commonwealth, Victorian Government and *The Living Murray* program. A small volume of water was also generously donated by community members. The delivery of the water was coordinated by the Mallee Catchment Management Authority, in conjunction with Parks Victoria.

Lindsay Island

Hattah Lakes

Site 8: **Lindsay Island**

'a diversity of local refuge habitat types for waterbirds, frogs, fish and turtles'

Background

Lindsay Island is part of the River Murray floodplain between Locks 6 and 8, approximately 120 kilometres west of Mildura. Prolonged drought and water extraction from the River Murray have resulted in a serious decline of river red gum communities across the River Murray's northwest floodplain. In 2003–04, the Victorian Government established an emergency watering program to provide water to the stressed river red gums. The current Commonwealth environmental water program builds on existing Victorian Government and *The Living Murray* watering programs. Lindsay Island is also one of the six icon sites under *The Living Murray* program.

Historically, the river red gum communities on Lindsay Island have been sustained by regular floods, normally in spring, but this has not occurred naturally since 2000. With limited water available during the drought, areas of river red gums that have a good chance of survival have been targeted for environmental watering.

Aims

The aim of the watering at Lindsay Island was to prevent further decline in river red gum tree health. Some of the river red gums on Lindsay Island are up to 500 years old, and approximately 170 hectares of these wetlands were targeted for environmental watering. The watering also aimed to maintain drought refuges for birds, frogs, turtles and fish.

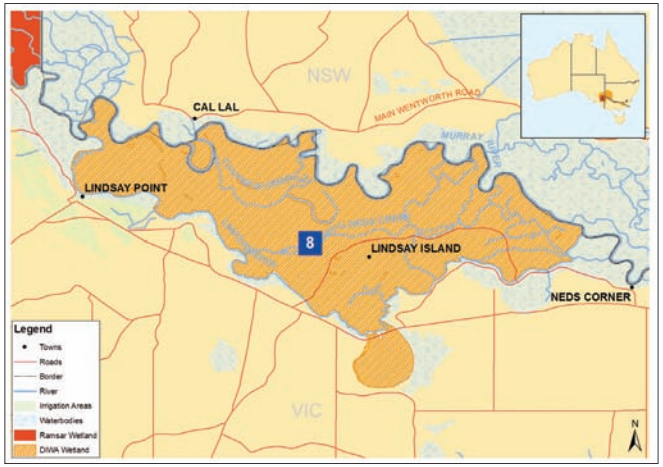
Outcomes

In the 2008–09 year, local environmental water managers have observed a moderate improvement in the canopy cover of river red gums at watered sites. This is in contrast to environmental watering in previous years where, due to the extremely stressed status of the trees, environmental water had achieved only a halt in the decline of tree health. Areas that did not receive water in the 2008–09 year have continued to decline.

Environmental watering provided significant drought refuge habitat and maintained a diversity of local refuge habitat types for waterbirds, frogs, fish and turtles. Species that have been observed since the watering include the Australian shoveler, hardhead duck (*Aythya australis*), great egret, white-faced heron (*Egretta novaehollandiae*), white-necked heron (*Ardea pacifica*), white-bellied sea-eagle (*Haliaeetus leucogaster*), Peron's tree frog and spotted grass frog. Water in Mullaroo Creek has supported its function as a nursery for Murray cod (*Maccullochella peelii peelii*).

Environmental watering — Lindsay Island, 2008–09

	Source	Environmental watering volume (megalitres)	Delivery start date	Delivery finish date
Lindsay Island	Victoria	600	14 Oct 2008	28 Oct 2008
	Commonwealth	1000	8 May 2009	11 June 2009
	Victoria	595		
	Total	2195		



Location map: Lindsay Island

Site 9: **Hattah Lakes**

'The Peron's tree frog and spotted marsh frog have also been recorded.'

Background

Hattah Lakes are a complex of 20 freshwater lakes fed by the River Murray downstream of Euston Weir. The lakes are located approximately 50 kilometres south–southeast of Mildura. When Hattah Lakes are full, they provide habitat for up to 47 waterbird species. With an abundance of plant and animal life, and river red gums, the site is an important community amenity. It is also internationally recognised, with 12 of the lakes part of the Hattah-Kulkyne Ramsar Site, which is designated as a Wetland of International Importance under the Ramsar Convention. The complex is also one of the six icon sites under *The Living Murray* program.

Hattah Lakes last received environmental water in 2006, when stressed river red gums urgently needed water to keep them alive. The watering resulted in a visible improvement in the health of the river red gums. It also triggered bird breeding.

By autumn 2008, the remaining water in the lakes had disappeared. Without further delivery of environmental water, the ecological health of the site would have deteriorated and future ecological recovery would have been difficult.

Aims

The primary aim of environmental watering of Hattah Lakes was to provide drought refuge for a range of species. Examples of such species are small vegetation-dependent fish such as the western carp gudgeon (*Hypseleotris klunzingeri*) and flathead gudgeon, and water birds such as the little egret (*Egretta garzetta*), white-necked heron and painted snipe *(Rostratula australis)*. The watering also aimed to prevent further decline in stressed areas of river red gums.

Outcomes

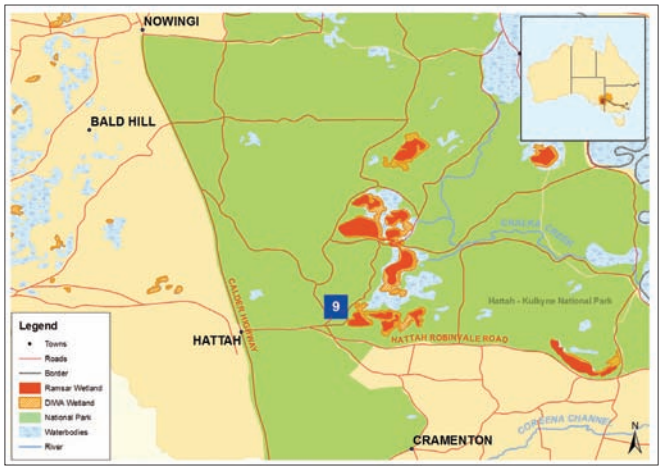
Water delivered to the Hattah Lakes complex filled Lake Lockie, Lake Little Hattah, Lake Hattah, Lake Yerang and Chalka Creek South — inundating an area of approximately 362 hectares.

The targeted areas of river red gums responded well with increased canopy cover and appeared to have healthier trunks and leaves. Green shoots have appeared on red gums that fringe the watered lakes. Aquatic vegetation has also responded strongly, supporting increased macroinvertebrate and fish communities.

Following the watering, waterbirds and water-dependent bird species flocked to the lakes. Monitoring coordinated by Mallee Catchment Management Authority has recorded species such as the hardhead duck, grey teal (*Anas gracilis*), pink-eared duck (*Malacorhynchus membranaceus*), Australian shoveler and great egret. With waterbird numbers estimated to be in the thousands, the lakes are now providing an effective and significant drought refuge. The Peron's tree frog and spotted grass frog have also been recorded.

Environmental watering — Hattah Lakes, 2008–09

	Source	Environmental watering volume (megalitres)	Delivery start date	Delivery finish date
Hattah Lakes	Commonwealth	2124	10 May 2009	27 June 2009
	The Living Murray program	1000		
	Victoria	1758		
	Donated water	16		
	Total	4898		



Location map: Hattah Lakes


Northern Territory
Queensland
Western Australia
South Australia
New South Wales
Backwater Lagoon
Australian Capital Territory
Victoria
Tasmania

New South Wales

One site in New South Wales was allocated water from the Commonwealth environmental water holdings; this site was:

- Backwater Lagoon.

The delivery of water was managed by the then Department of Water and Energy in cooperation with the then Department of Environment and Climate Change. The New South Wales Government monitored the outcomes of the watering.

Backwater Lagoon

Site 10: **Backwater Lagoon**

'improved growing conditions in the spring'

Background

Backwater Lagoon is located in the Wangumma State Forest, between the inlet and outlet of Lake Victoria, west of Wentworth. Backwater Lagoon is surrounded by woodlands dominated by mature river red gums, black box and coobah, and an understorey consisting mainly of severely drought-affected lignum, as well as saltbushes and forbs. In the past, Backwater Lagoon has supported a range of frog and bird species, including the great egret, a migratory species listed under the *Environment Protection and Biodiversity Conservation Act 1999* and the China–Australia Migratory Bird Agreement.

Aims

The primary aim of the watering was to provide drought refuge for frog and bird populations. Watering was conducted in autumn and early winter to minimise evaporation losses, recharge groundwater and establish good levels of soil moisture to allow vegetation to take full advantage of improved growing conditions in the spring.

Outcomes

An area of 12.5 hectares was inundated and filled Backwater Lagoon to capacity. This watering event also flooded a number of adjoining wetland depressions.

The monitoring program conducted by the New South Wales Government observed a number of waterbird species, such as the Australian shelduck, grey teal and Pacific black duck (*Anas superciliosa*), and a number of frog species, including the eastern sign-bearing froglet. This was consistent with previous watering, conducted as part of a Red Gum Rescue Project by the New South Wales Government, which also noted improved frog breeding and improved habitat for 19 waterbird species.

Improved water quality, confirmed by monitoring results, also contributed to an increase in the abundance of microcrustaceans and to good spring growth on a number of mature river red gums in the lagoon.

Waterbirds

Each year, Australia's wetlands and floodplains play host to a range of migratory waterbirds from countries such as China, Republic of Korea, Russia and Japan. Waterbirds depend on the wetlands for feeding, breeding and nesting. However, populations of waterbirds in the Murray-Darling Basin have declined in recent years. This decline has coincided with a decrease in the area of wetland habitat available for waterbirds to feed and breed.

Environmental watering — Backwater Lagoon, 2008–09

Location	Environmental watering volume (megalitres)	Delivery start date	Delivery finish date
Backwater Lagoon	1000	5 June 2009	28 June 2009

Location map: Backwater Lagoon

Acknowledgments

Australian Government

- Murray-Darling Basin Authority – *The Living Murray* Program

South Australia

- South Australian Murray-Darling Basin Natural Resources Management Board
- South Australian Department for Environment and Heritage
- Wetlands Habitat Trust and Paiwalla Pty. Ltd.
- Overland Corner Branch of the National Trust of South Australia
- Overland Corner Wetland Rehabilitation Group

Victoria

- Victorian Department of Sustainability and Environment
- Mallee Catchment Management Authority
- Parks Victoria
- Sunraysia Bird Monitors

New South Wales

- New South Wales Department of Environment, Climate Change and Water

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Page 14:	Musk duck (Rebecca Gee)
Page 16:	Murray hardyhead (South Australian Murray-Darling Basin Natural Resources Management Board)
Page 18:	Freckled duck (Andrew Tatnell)
Page 21:	Regent parrot (Nick Rains)
Page 22:	Black swan (Nick Rains)
Page 26:	Great egret (Andrew Tatnell)
Page 28:	Perons tree frog (Rebecca Gee)
Page 34:	Pacific black duck (Rebecca Gee).

Australian Government

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Murray-Darling Basin Authority