

The Commonwealth Environmental Water Holder acknowledges Australia's traditional owners and respects their continued connection to water, land and community. We pay our respects to them and their cultures and to their elders both past and present.



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Australian Government

Commonwealth Environmental Water Office

RESTORING AND PROTECTING THE LOWER MURRAY-DARLING

2016-17



Above: Smoking ceremony held at the launch of the Partnership Agreement between the Commonwealth Environmental Water Holder and the Ngarrindjeri Regional Authority. Photo: Matt Turner, Nature Foundation South Australia
Cover: River Murray at Waikerie
Back cover: Pelicans with the Coorong in the background
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Environmental water is dedicated to improving the health of our rivers, floodplains and wetlands

The Lower Murray-Darling region contains diverse and rich natural environments. Its natural waterways are a water source for domestic use, diverse agriculture, tourism and recreational activities and Aboriginal cultural values and practices.

Environmental water is delivered to key locations through the region to support its many unique native animals, plants, birds and fish. The Lower Murray-Darling's river system, floodplains, swamps and wetlands provide habitat for threatened animals including the Regent parrot and Australasian bittern, Murray cod, Murray hardyhead, silver perch, southern bell frog and Murray tortoise. The Lower Murray-Darling also features a number of internationally significant wetlands including the Coorong, and Lakes Alexandrina and Albert Wetland, the Riverland complex and Hattah-Kulkyne Lakes.

Commonwealth environmental flows are designed in partnership with state and local delivery partners to improve connections between rivers, floodplains and wetlands, particularly, to those sites that support internationally significant

wetlands and nationally threatened species under the *Environmental Protection and Biodiversity Conservation Act 1999* and state-based legislation. We are also working toward the achievement of environmental outcomes as outlined in the Basin-wide Environmental Watering Strategy (part of the implementation of the Murray-Darling Basin Plan).

Summary of longer-term outcomes under the Basin-wide Environmental Watering Strategy



Maintain base river flows, with the region experiencing more bank-full and 'fresh' events.

Improved overall flows in the River Murray by 30 per cent and to the Murray Mouth by 30-40 per cent.

Levels in the Lower Lakes are maintained above 0.40 metres and barrage flows are greater than 2000 GL/year on a three-year rolling average to manage salinity in Lake Alexandrina and the Coorong.

A fresh event describes an increase in levels of the river beyond the base flow, but does not fill the river or go over the bank.



Maintain current extent of river red gum and blackbox communities, along with improvements to condition including increased numbers of young trees.



Maintain the extent of, and improve the condition of, lignum communities, particularly in the Lower Darling region and the River Murray, from the Junction with the Wakool River to downstream

of Lock 3, including Chowilla and Hattah lakes.



Maintain the extent of and prevent further decline in riparian and in-stream native vegetation communities, particularly in, or near to, the River Murray, the Lower Darling River and the Great Darling Anabranch.

Maintain an adequate population of *Ruppia tuberosa* in the south lagoon of the Coorong.



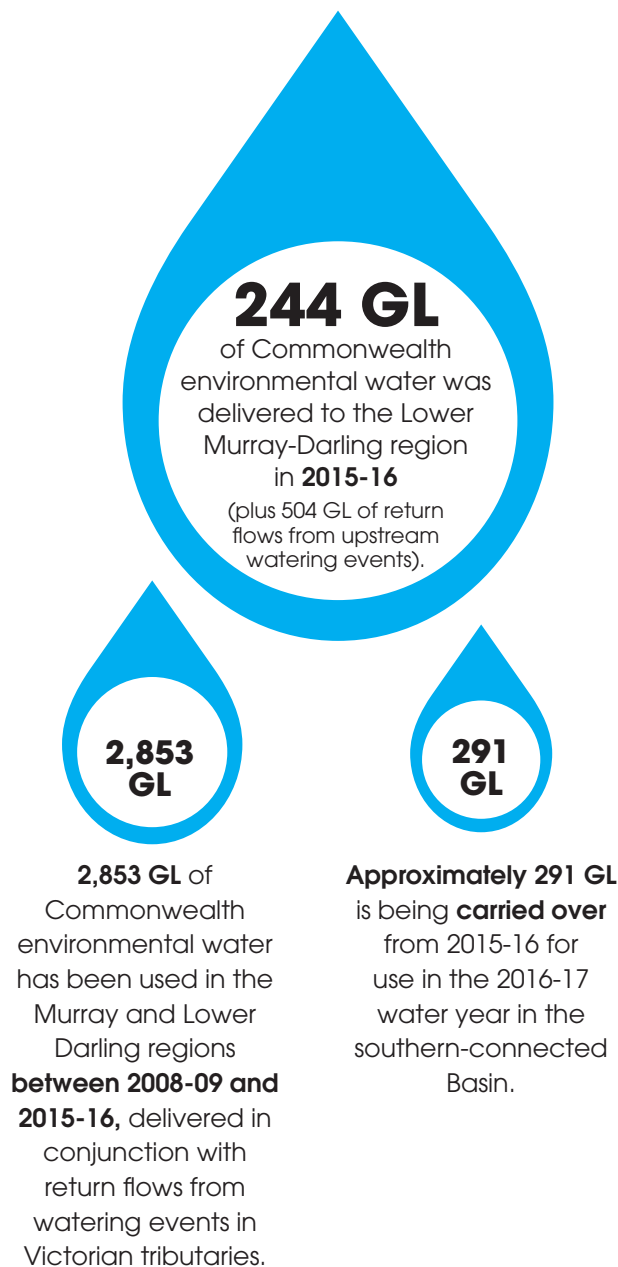
Maintain the current species diversity and increase abundance of waterbirds by supporting breeding opportunities.

Maintain current populations of migratory shorebirds at the Coorong.



Create the right conditions that encourage fish to move between areas and improve the age ranges, genetic diversity and health of their communities.

Maintain estuarine fish in the Coorong, including an increase in spawning and recruitment of mullet and the broad distribution of black bream and greenback flounder.



To date, there have been no specific requirements for sale or purchase of Commonwealth environmental water in the Lower Murray-Darling region.

Environmental water use in the Lower Murray-Darling to date

Delivery of environmental water across the Lower Murray-Darling is planned and managed by the Commonwealth Environmental Water Holder and state governments in consultation with local land and water managers and communities, as part of the Murray-Darling Basin Plan implementation.

During 2010 to 2012, natural flow events and environmental watering saw improvements in the condition of many wetlands in the Lower Murray-Darling and contributed to recovery from the millennium drought. Drier conditions from 2013 to 2016 have seen some floodplain and wetland sites entering into a natural drying phase, while river flows have also reduced in scale.

Commonwealth environmental water supply

The water acquired by the Australian Government, including through investment in more efficient irrigation infrastructure and other measures, enables the Commonwealth Environmental Water Holder to help bring back some of the river flows needed to restore and protect the natural system throughout the Basin.

Commonwealth environmental water often complements natural events and environmental water provided by the New South Wales Office of Environment and Heritage, the Victorian Environmental Water Holder, the South Australian Department of Environment, Water and Natural Resources and the Living Murray.

Depending on river operating rules, flow constraints and climatic conditions, the Commonwealth Environmental Water Holder can agree to:

- use water to meet identified environmental demands
- hold on to the water and carry it over for use in the next water year ('carryover')
- trade (sell water or buy in another catchment) for equal or greater environmental benefit.

Our partners

The best approaches to environmental water management involve local knowledge and the latest science.

Commonwealth environmental water is planned, delivered and managed in partnership with a number of people in the Lower Murray-Darling region, including:

- New South Wales Office of Environment and Heritage (including the National Parks and Wildlife Service)
- New South Wales Department of Primary Industries - Water
- WaterNSW
- Lower Murray Water
- New South Wales Department of Primary Industries - Fisheries
- Murray Local Land Services
- Western Local Land Services
- Victorian Environmental Water Holder
- Goulburn-Murray Water
- Mallee Catchment Management Authority
- South Australian Department of Environment, Water and Natural Resources
- South Australian Murray-Darling Basin Natural Resources Management Board
- SA Water
- Nature Foundation South Australia
- Banrock Station

- Ngarrindjeri Regional Authority
- Renmark Irrigation Trust
- Murray Darling Wetlands Working Group Ltd
- Tar-Ru Lands Board of Management
- Local councils and planning groups
- Private landholders
- Murray-Darling Basin Authority

The Commonwealth Environmental Water Office regularly attends community forums, events and committees within the catchment. We will continue to forge local partnerships that allow community groups, including Aboriginal Traditional Owners, to help shape the regional planning and management of environmental water delivery over the long term.

Please contact your local engagement officer, Michelle Campbell or Richard Mintern, to learn more about our work or offer suggestions for the use of environmental water locally.

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*Fishing on the River Murray in Wallpolla State Forest.
Photo: Murray-Darling Basin Authority*



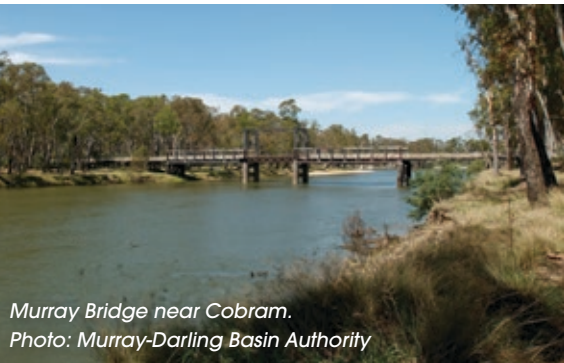
*Birdwatching on the River Murray at Hattah National
Park. Photo: Murray-Darling Basin Authority*

LOWER MURRAY-DARLING RIVER REGION

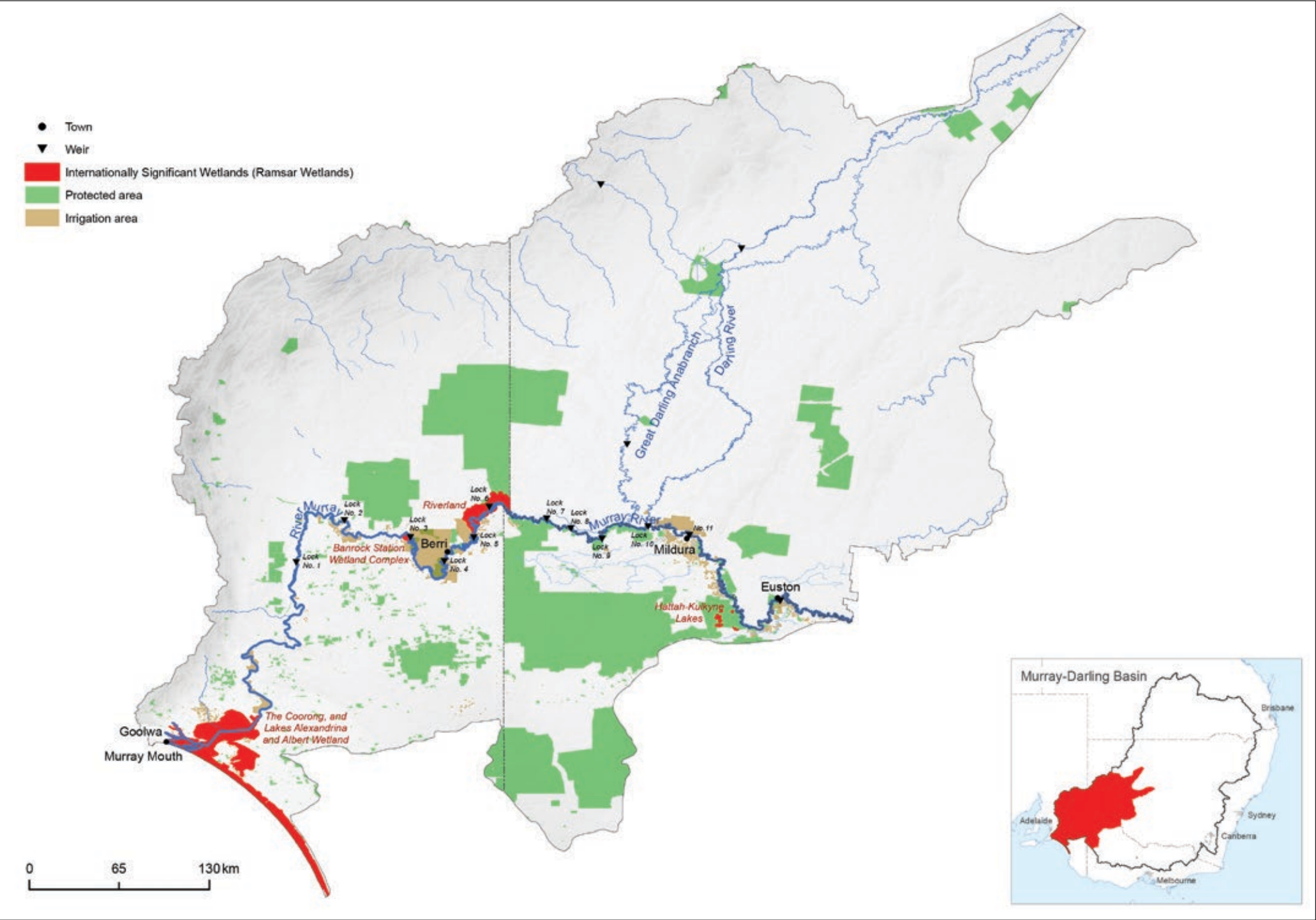


The Lower Murray-Darling Region is made up of the River Murray downstream of Lock 15, near Euston, to the Murray Mouth in South Australia and the Darling River below Menindee Lakes and the Great Darling Anabranch.

In its lower catchment, the River Murray flows through semi-arid mallee country, where the only substantial water source is the River itself. Large floodplains have developed along the River's path. The Murray flows into Lake Alexandrina, which supplies Lake Albert to its east, and out to the Southern Ocean through the Coorong and Murray Mouth.



Murray Bridge near Cobram.
Photo: Murray-Darling Basin Authority



The water resources of the River Murray are regulated from its source to the ocean, to provide water for hydroelectric power generation, urban centres, irrigated agriculture and the environment. Lake Victoria is the major storage in the Lower Murray-Darling region, which is used to supply regulated flows to South Australia. Menindee Lakes are used to manage and augment supplies to the Lower Murray system. End-of-river flows are captured in Lake Alexandrina and Lake Albert and releases are made to the Coorong and through the Murray Mouth via the barrages. Along the length of the River Murray, water is also pumped directly from the River or diverted through small weirs to secure water for individual properties.

Responding to environmental demands

Like all water users, Commonwealth and state water holders and managers must consider variable seasonal conditions to manage the best way to protect the Basin's rivers, floodplains and wetlands.

This involves careful consideration of the urgency of environmental demands each year (and over multiple years) and what we believe can be achieved depending on water availability due to conditions.

The following scenarios for the use of Commonwealth environmental water in the Lower Murray-Darling are based on our assessment of environmental demands (in the context of targeted outcomes and watering requirements in 2016-17, watering history, asset condition and the available supply according to different scenarios).

River Murray channel: There is a moderate demand for water to improve the seasonality and variability of flows along the length of the River and reconnect with low-lying wetlands.

Commonwealth environmental water is expected to be delivered as a 'whole-of-system' flow in 2016-17. Similar to the approach followed in 2015-16, watering will be guided by natural triggers (for example, rainfall) and will commence in late winter and continue through spring.

The 'whole of system' flows will be scalable so that the environmental watering is responsive to seasonal and operational conditions. This means that if conditions are dry and the triggers are small, environmental watering will be focused on in-stream watering, such as varying flows and connecting with low-lying creeks and wetlands, to support fish health and movement, and riverbank and aquatic vegetation.

If conditions are wetter, environmental water may be used for small floodplain watering events (within constraints to avoid impacts on others), targeting outcomes such as fish breeding, promoting important floodplain vegetation communities, and supporting the completion of waterbird breeding events.

Environmental flows moving through the system will be able to be used for other activities that are considered seasonally appropriate, such as delivery to off-channel wetland sites (see below).

Floodplain and wetlands from Euston to the Lower Lakes: There is a moderate to high demand to provide flows to low-lying wetlands and anabranches. These flows would continue to support the recovery of native vegetation, bird and fish communities. Depending on specific proposals from delivery partners, watering may focus on a range of wetland sites across all three states as well as creeks and anabranches such as the Lindsay River and Murrumbidgee Creek that provide flowing habitat for native fish. Commonwealth environmental water may be provided to support weir pool manipulation activities, where the raising of weir pools provides benefit to a range of sites that are not normally connected to the river at normal pool levels, while also returning nutrients and organic matter to the river channel. Overbank flows to support the ongoing recovery of floodplain and wetland vegetation would be in scope if conditions become wetter.

Hattah Lakes have a low to moderate demand for water due to significant watering events throughout 2013-14 to 2015-16. These events supported vegetation and provided habitat for native fish and waterbirds. Watering of Hattah Lakes will be informed by natural triggers, with water being provided only if higher flows occur in the River Murray.

Coorong, Lower Lakes and Murray Mouth: Large volumes of environmental water in recent years have significantly improved conditions in the Lower Lakes. However, there is a very high demand for water in the Coorong. Conditions in the Coorong remain poor and environmental water is critical to maintain habitat for native estuarine fish and avoid damage to *Ruppia tuberosa*.

The condition of *Ruppia tuberosa*, a native water grass, is an indicator of water availability



Picnic at the junction of the Murray and Darling Rivers. Photo: Murray-Darling Basin Authority

and salinity and the ecological character of the Coorong as a whole. The reproduction requirements of the native grass are influenced by the extent in which the Coorong's mudflats are covered in water over spring and summer. Under dry to moderate conditions, the contribution of environmental water, including re-using water from upstream actions, will be critical to achieving minimum flow requirements to the Coorong. Similar to previous years, Commonwealth environmental water will be delivered to the Lower Lakes to provide barrage flow into the Coorong to maintain water levels and manage the risk of high salinity in summer.

Lower Darling and Great Darling Anabranch: The Lower Darling River stopped flowing during 2015-16, leading to a critical demand for water. The Anabranch has not received environmental water since 2014-15 resulting in a moderate-high demand for water to support on-going vegetation recovery, including river red gums and black box communities.

Despite the high demand for water, Commonwealth environmental water will not be able to meet this demand while conditions remain dry due to allocation restrictions. If water availability improves and it becomes feasible to deliver environmental water, it will be a high priority to use Commonwealth environmental water to manage water quality and restore aquatic habitat.

For further information on our planning process and for a copy of the Portfolio Management Plan for the Lower Murray-Darling region 2016-17 visit www.environment.gov.au/water/cewo.

Outcomes snapshot

Scientific monitoring shows that water delivered to the Lower Murray-Darling is providing habitat and breeding opportunities for many of the region's unique native fish, waterbirds, plants and wildlife.

Full monitoring reports are available each year on our website: www.environment.gov.au/water/cewo/catchment/lower-murray-darling/monitoring

2014-15

Our long-term intervention monitoring programme found:

- Continuous flows into the Coorong were critical to protecting *Ruppia* and estuarine fish species from increasing salinity. Environmental water contributed a significant proportion of the total amount of nutrients exported from the River Murray, Lower Lakes and Murray Mouth.
- Commonwealth environmental water contributed all of the flows over the Lower Lakes' barrages into the Coorong from November 2014 to June 2015, enabling the export of more than half of the total salt exported from the Lower Lakes.
- Environmental water contributed to increased water velocity in the river channel, increasing the amount of flowing water habitats, which is important for fish such as Murray cod.

Monitoring by our partners in South Australian wetlands found:

- The populations of the endangered Murray hardyhead improved at Berri and Disher Creek sites following several years of Commonwealth environmental watering. In early 2015, a sub-population was translocated to Brickworks Billabong in Victoria, a site also being rehabilitated with Commonwealth environmental water. There has since been evidence of the translocated Murray hardyhead reproducing at the new site.
- Across all sites, river red gum, black box and lignum have increased crown extent and density, tip growth and flowering.

- Seven frog species, including the threatened southern bell frog, were found in several sites.
- A range of waterbird species were recorded at watering sites, including threatened and endangered species, indicating that a diversity of suitable habitat and food types were present.

2013-14

Our intervention monitoring found:

- System-wide flows contributed to environmental outcomes throughout the River Murray system. This includes connectivity across the system and support for vital ecosystem processes such as nutrient cycling, the export of salt and the dispersal of fish larvae.
- Water quality continued to improve as salt was exported into the Southern Ocean through the Murray Mouth.

Monitoring by our partners in South Australian wetlands found:

- A range of waterbird species were recorded at watering sites, including threatened and endangered species, indicating that a diversity of suitable habitat and food types were present.
- A range of wetland frog species, including the vulnerable southern bell frog, were detected at watering sites.
- There were positive responses from river red gum, black box, river cooba, lignum and aquatic plants (including reeds and water milfoil) at watering sites, evident through growth, buds, flowering, increased groundcover, seedling growth and survival and an increase in total number of seedlings.