

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.



T: 1800 803 772
E: ewater@environment.gov.au
W: www.environment.gov.au/water/cewo

 @theCEWH

Postal address:
GPO Box 787, Canberra ACT 2601



Australian Government

Commonwealth Environmental Water Office

RESTORING AND PROTECTING THE MID-MURRAY RIVERS

2016-17

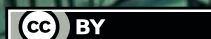


Above: Aboriginal marker tree near Mathoura NSW

Cover: Edward River, near Deniliquin

Back cover: Kangaroos on Deniliquin Island, Edward River

All images by Commonwealth Environmental Water Office unless noted otherwise.



© Commonwealth of Australia, 2016

WAT387.0516C

Environmental water is dedicated to improving the health of our rivers, floodplains and wetlands

The Mid-Murray region contains diverse and rich natural environments. Its natural waterways are a source of water supply for domestic water use, extensive agriculture and irrigated production, the cultural values and practices of local Aboriginal Traditional Owners and tourism and recreation activities.

Environmental water is delivered to key locations to support the region's unique native animals, plants, birds and fish that rely on healthy natural waterways including the internationally important forests.

The region is home to a vast estate of river red gum forests, wetlands and floodplains lining the River Murray including Barmah-Millewa, Gunbower, Koondrook-Perricoota and Weraí forests. Collectively, these forests support 550 plant and 270 animal species, including threatened species such as the Australasian bittern, superb parrot, Mueller daisy, swamp wallaby grass, silver perch, Murray cod and trout cod. Gunbower Forest also supports the only

breeding colony of intermediate egret in Victoria and, along with Barmah-Millewa Forest, supports the breeding of threatened and vulnerable birds including the Australasian bittern.

Commonwealth environmental water is managed in partnership with state and local delivery partners to improve connections between rivers, floodplains and wetlands, particularly to those sites that support nationally threatened species under the *Environmental Protection and Biodiversity Conservation Act 1999* and state-based legislation, and wetlands of international or national significance. 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.

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 and greater likelihood of young tree survival. These communities are essential for providing food and habitat for many native animals

across the Basin, and they are culturally significant to local Aboriginal people.



Maintain the extent of and prevent further decline in riparian and in-stream native vegetation communities, particularly those in, or near to, the Murray, the Edward-Wakool system, Kiewa, and the Moira grasslands in the Barmah-Millewa Forrest.



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



Create the right water conditions to improve native fish condition and spawning, movement between areas, and improve the age ranges and health of their communities.



Golden perch caught in the River Murray channel
Photo: Murray-Darling Basin Authority

Environmental water use in the Mid-Murray to date

The delivery of environmental water in the Mid-Murray region is planned and managed by the Commonwealth and Victorian Environmental Water Holders, New South Wales Office of Environment and Heritage, and the Murray-Darling Basin Authority's 'the Living Murray' program, in consultation with local communities, as part of the Murray-Darling Basin Plan's implementation.

During the 2010 to 2012 period, natural flow events and environmental watering saw improvements in the condition of many wetlands in the Mid-Murray and contributed to recovery from the millennium drought. Drier conditions from 2013 to 2015 have seen some floodplain and wetland sites entering into a drying phase, while river flows have also reduced in scale.

This year, Commonwealth environmental water is set to contribute to joint efforts to support waterbird habitat, native fish flows, migration, spawning and recruitment, and riverbank and aquatic vegetation. Natural triggers (for example, rainfall) and seasonal and operational conditions will guide watering, anticipated to commence in late winter and through spring.

Recruitment describes a species' (like native fish, frogs and turtles) survival through all life stages, from spawning, juvenile to adulthood.

The Commonwealth Environmental Water Holder aims to create or support breeding events and recruitment so that over the long-term a species' population features a range of ages (young to old).

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's irrigation districts.

Commonwealth environmental water often supplements natural events and environmental water provided by other water holders and managers.

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 or buy water) for equal or greater environmental benefit.

393 GL

of Commonwealth environmental water was used in the Mid-Murray region in **2015-16.**

291 GL

Approximately **291 GL** was **carried over** from 2015-16 for use in the 2016-17 water year in the southern-connected Basin.

2,853 GL

2,853 GL of Commonwealth environmental water has been used in the Murray and Lower Darling regions **between 2008-09 and 2015-16**, delivered in conjunction with return flows from watering events in Victorian tributaries.

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

Our partners

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

Commonwealth environmental water use is planned, delivered and managed in partnership with a number of individuals and organisations in the Mid-Murray, including:

- New South Wales Office of Environment and Heritage (including National Parks and Wildlife Service)
- New South Wales Department of Primary Industries – Fisheries
- WaterNSW
- Murray Irrigation Limited
- New South Wales Department of Primary Industries - Water
- New South Wales Local Land Services
- Victorian Environmental Water Holder
- Victorian Catchment Management Authorities
- Goulburn-Murray Water
- Murray-Darling Wetlands Working Group Ltd
- Murray-Lower Darling Environmental Water Advisory Group
- Local landholders and community members
- 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 Linda Duffy to learn more about our work or offer suggestions for the use of environmental water locally.

Linda Duffy

Local engagement officer – Deniliquin NSW
M: 0419 188 430
E: linda.duffy@environment.gov.au

Fishing on the River Murray. Photo: Murray-Darling Basin Authority



Reed Beds Swamp in the Millewa Forest at dusk.
Photo: Murray-Darling Basin Authority



Black Swan cygnet in its nest on the Black Swamp, near Gunbower Creek. Photo: Murray-Darling Basin Authority

MID-MURRAY REGION



Australian Government
Commonwealth Environmental Water Office

The Mid-Murray region extends from the Hume Dam, near Albury in New South Wales to the Euston Weir. At Euston, the Lower Murray-Darling region begins. The Mid-Murray is a highly regulated section of the Murray-Darling Basin, with major storages and infrastructure including Hume Dam, Dartmouth Dam Yarrawonga Weir, Stevens Weir and Torrumbarry Weir. A natural constriction point in the River, known as the Barmah Choke, also influences water delivery.

Tributaries in this region include Kiewa, Ovens, Goulburn-Broken, Campaspe, Loddon and Murrumbidgee Rivers and Broken Creek.

The Mid-Murray region features a major anabranch and floodplain system, the Edward-Wakool. The Edward-Wakool supports a high proportion of native fish at all stages of their lifecycle including threatened species such as the Murray cod, trout cod, and silver perch. It also provides refuge during drought.

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 restore the Basin's rivers, floodplains and wetlands.

This involves careful consideration of the urgency of environmental demands each year (from year to 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 2016-17 are based on our assessment of environmental demands (in the context of targeted outcomes and watering requirements, watering history,

asset condition and the available supply according to different scenarios).

River Murray Channel 'whole of system' flows: 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 is anticipated to 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).

Edward-Wakool River System in-channel base flows and freshes to forests and ephemeral (not permanent) waterways and wetlands:

Commonwealth environmental water will most likely contribute to in-channel base flows and freshes in Edward River, Wakool River, Yallakool Creek, Colligen Creek and Niemur River, to maintain habitat and to support aquatic vegetation and native fish. In the ephemeral (not permanent) waterways, such as Tuppall Creek, watering will look to maintain in-stream habitat, particularly water quality and vegetation. In the Edward-Wakool forests, such as Weral Forest, the priority of environmental watering would be to protect and maintain vegetation health, support the transport of carbon and nutrients and possibly support waterbird breeding events if they occur.

Gunbower Creek: In 2016-17 Commonwealth environmental water will contribute to year-round variable flows to mimic more naturally variable flows to support the survival of juvenile fish, stimulate movement of native fish and aquatic invertebrates, and transport carbon between Gunbower Creek and Gunbower Forest. Environmental water may supplement some of the flows required for consumptive purposes.

Gunbower-Koondrook-Perricoota Forest: It is unlikely that Commonwealth environmental water will be delivered to Gunbower Forest in 2016-17, as it is anticipated that other water holders will meet demands unless conditions become wet. Similarly, Commonwealth environmental water is unlikely to be used in Koondrook-Perricoota Forest until issues regarding potential third party impacts are resolved.

Central Murray off-channel wetlands and ephemeral creeks - Hume to Euston: It is anticipated that the demands of native fish and vegetation of the permanent and semi-permanent wetlands will be met by a number of water holders in 2016-17. Commonwealth environmental water may be provided to several wetlands, consistent with local planning processes managed by state delivery partners. For example, up to 90 ML of Commonwealth environmental water has been made available for refilling Norman's Lagoon,



Hume Dam, near Albury NSW

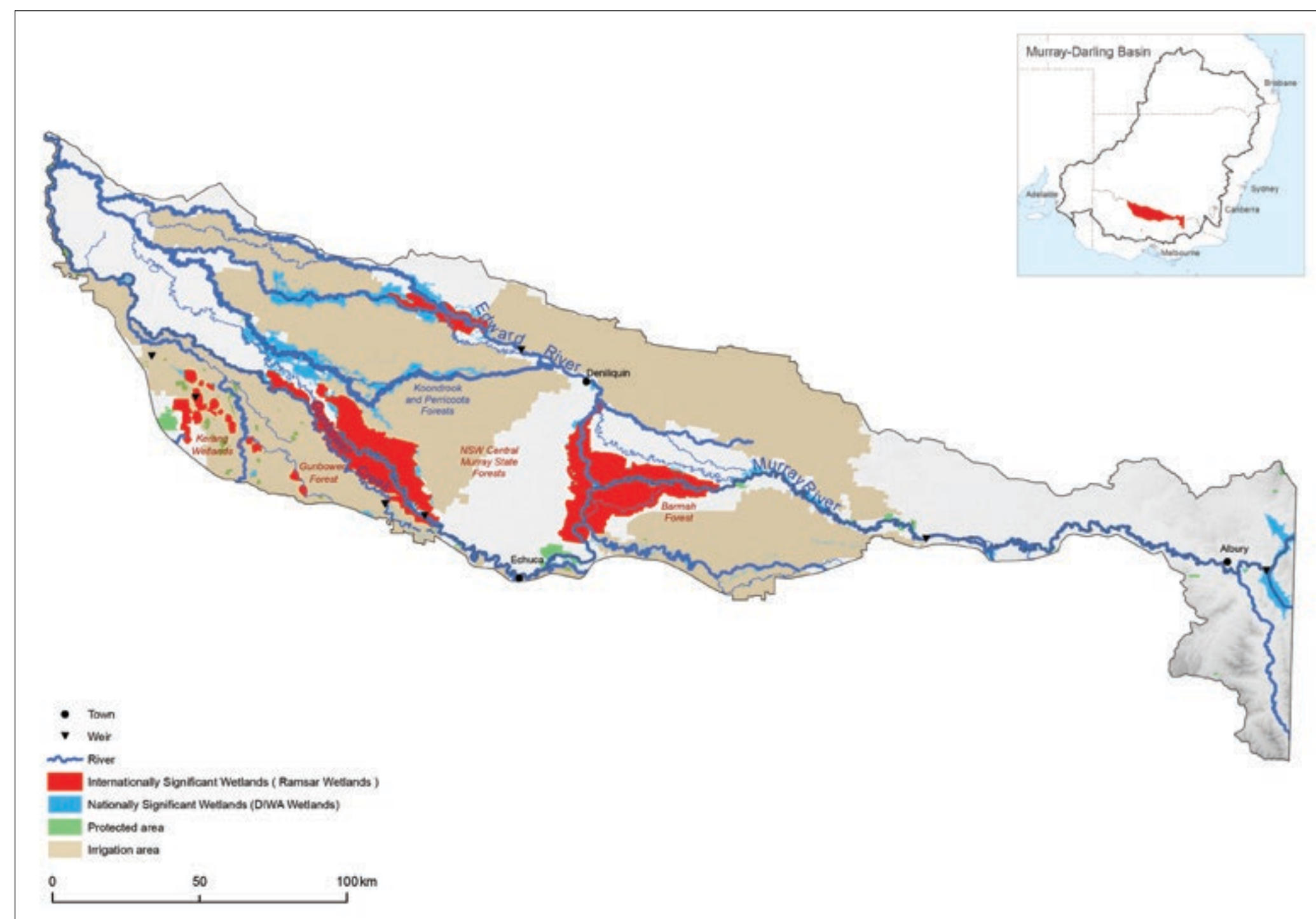
near Albury, following draining of the lake to remove carp and installation of a carp-screen. This watering event is part of a rehabilitation project involving a number of government agencies, local council and community groups.

Environmental flows moving through the Mid-Murray are used for objectives within the Mid-Murray and the Lower Murray downstream, including Hattah Lakes, the Chowilla Floodplain and Lower Lakes, Coorong and Murray Mouth.

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



Gunbower Creek, near Spence's Bridge



Outcomes snapshot

Scientific monitoring shows that water delivered to the Mid-Murray is providing food, 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/mid-murray/monitoring

2015-16

Water directed to the Barmah and Millewa Forests contributed to the growth of Moira grass, and supported breeding of over one thousand pairs of water birds including white and straw-necked ibis, spoonbills, eastern great egrets, nankeen night herons, darters and little pied cormorants.

Additionally, a significant proportion of the global population of Australasian bitterns and little bitterns inhabit the forests and were detected breeding. This watering action has also contributed to the spawning of the golden perch and the critically endangered silver perch in the Murray region.

In the Edward-Wakool system preliminary monitoring results suggest that the primary objectives for the 2015-16 flows have been achieved. This included providing areas of habitat for native fish, such as Murray cod, to move into and spawn, and maintaining the growth and health of instream aquatic plants (such as common reed, pondweed and milfoil), that provides habitat for aquatic animals (like zooplankton and insects) which become food for small native fish, including gudgeons, smelt, hardyheads, as well as young cod and perch. There was a notable increase in silver perch recruits in 2015-16 and the role of environmental flows in contributing to this outcome is being explored in more detail with flows planned for 2016-17.

2014-15

Increased levels of dissolved oxygen and aquatic vegetation growth were evident in the Edward-Wakool system.

A native obscure galaxias was found in the Edward-Wakool system for the first time in five years of monitoring. There is a general trend of improvement in the native fish community in the Edward-Wakool system following the millennium drought, widespread flooding and hypoxic blackwater fish kills in recent times.

Environmental water inundated sedges and grasses especially along the riverbanks of the Yallakool Creek and the mid-Wakool River, creating shallow vegetated habitat allowing frogs to spawn and tadpoles to thrive.

A strong response by aquatic and semi-aquatic plant species was observed in-stream and in wetlands of the Edward-Wakool system that received environmental water during spring 2014 as a result of a longer, slower recession to environmental flows.

2013-14

Improved connectivity between rivers and creeks which has prompted fish breeding and mixing as they moved to and from the Wakool Reserve refuge pool.

General increase in native fish populations including the vulnerable Murray Cod in the Edward-Wakool.

Environmental water was used to provide baseflows in Gunbower Creek over the winter and a high stable flow during spring. The winter baseflows were important to ensure that adult fish remained in good condition ready for spring migration and spawning. The spring watering is important to allow Murray cod to spawn, protect their nests and for larvae to emerge and drift downstream. Monitoring during spring and early summer identified that Murray cod spawned at least three times.