

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**

# **MID-MURRAY REGION**

**2017-18 SNAPSHOT**

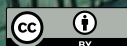


*Above: Water inundates Reed Beds Swamp  
at Barmah-Millewa Forest*

*Cover: The Edward River within Werai*

*Back cover: Instream native aquatic vegetation  
in Gunbower Creek*

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noted otherwise.*



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# We use environmental water to improve the health of our rivers, floodplains and wetlands

Throughout the Murray–Darling Basin, we deliver water to important locations to support the health of waterways and the many unique native animals, plants, birds and fish that depend on them to survive and thrive.

The Mid-Murray region contains diverse and rich natural environments. Its waterways are a source of water for domestic use and extensive agriculture, are central to the cultural values and practices of local Aboriginal traditional owners, and support tourism and recreation activities.

The Australian and state governments own water that is used to protect and restore the environment in the Mid-Murray region. This water is delivered to key locations to support the region's unique native plants, fish, frogs and birds that rely on healthy waterways to feed, breed and survive.

The region is home to internationally important river red gum forests, wetlands and floodplains including Barmah–Millewa, Gunbower, Koondrook–Perricoota and Werai forests. Collectively these forests support 550 plant and 270 animal species, including threatened species such as swamp wallaby grass, Murray and trout cod, silver perch, Australasian bittern and superb parrot. Gunbower Forest supports the only

breeding colony of intermediate egret in Victoria. The Edward–Wakool anabranch and waterways support a high proportion of native fish at all stages of their life cycle and provide refuge habitat during drought.

The Commonwealth Environmental Water Office works in partnership with state government agencies and local organisations to plan and manage flows for the environment. We are working to achieve environmental outcomes as outlined in the Basin-wide Environmental Watering Strategy and the Murray–Darling Basin Plan.

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



Maintain base river flows and increase the number of bank-full and 'fresh' events. A fresh event is an increase in a river's water levels beyond the base flow. It does not fill the river or go over the bank.



Maintain the current area of river red gum and black box forests and woodlands, improve their condition and increase the survival rate of young trees.

Maintain the area of non-woody native plants on the banks and in-stream, particularly in or near the River Murray, the Edward–Wakool system and the moira grasslands in Barmah–Millewa Forest.



Maintain the current waterbird species diversity and increase their populations by supporting breeding opportunities.



Create the right conditions to improve native fish health, spawning and movement, with the aim of increasing the overall fish populations.



Water inundates river red gums at Barmah Forest

## Water for the Mid-Murray environment to date

The environmental need for water is a reflection of the health of rivers, wetlands and floodplains, and the plants and animals they support. Ecological health is influenced by flows and conditions in the past. In some cases this can date back many years—parts of the Mid-Murray environment are still showing the effects of the millennium drought.

Between 2010 and 2012, high natural flows and targeted environmental water delivery resulted in improvements in the condition of many sites in the Mid-Murray and helped recovery following the millennium drought. In drier conditions from 2013 to early 2016, some floodplain and wetland sites entered into a natural drying phase, and the scale of river flows reduced.

Very high rainfall over winter and spring 2016 led to the largest natural flood in 20 years in the Mid-Murray. This benefited wetland and floodplain plants and supported waterbird breeding. The natural floods also caused a large hypoxic blackwater event. While environmental water was used to mitigate the impacts on native fish populations, the hypoxic blackwater still killed many fish.

Key needs for 2017–18 include supporting the recovery of native fish populations after the blackwater event, consolidating the growth of native plants following the flood and continuing to provide food and habitat for recently fledged waterbirds, as well as supporting naturally triggered breeding.

## Supplying water for the environment

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

We use this water to supplement natural floods and water provided by other environmental water holders.

Depending on river operating rules, flow constraints and climatic conditions, the Commonwealth Environmental Water Holder can decide 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 (buy or sell water) for equal or greater environmental benefits.

**357 GL**

of Commonwealth environmental water was used in the Mid-Murray Region in **2016–17**

**320 GL**

**Approximately 320 GL** is being **carried over** from 2016–17 for use in the 2017–18 water year in the southern-connected Basin.

**3,222 GL** of Commonwealth environmental water has been used in the Murray and Lower Darling regions **between 2008–09 and 2016–17** delivered in conjunction with return flows from watering events in Victorian tributaries.

**3,222 GL**



# Our partners

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

Commonwealth environmental water is planned, delivered and managed in partnership with individuals and groups in the Mid-Murray. Partners include:

- the New South Wales Office of Environment and Heritage (including the National Parks and Wildlife Service)
- the New South Wales Department of Primary Industries
- WaterNSW

- Murray Irrigation Ltd
- New South Wales Local Land Services
- the Victorian Environmental Water Holder
- Victorian catchment management authorities
- Goulburn-Murray Water
- the Edward-Wakool Environmental Water Reference Group
- Murray-Darling Wetlands Working Group Ltd
- the Murray Lower Darling Environmental Water Advisory Group
- local landholders and community members
- the Murray-Darling Basin Authority.

The Commonwealth Environmental Water Office regularly attends community forums, events and committees in the catchments. We continue to forge local partnerships to ensure that community groups, including Aboriginal traditional owners, have the opportunity to help shape the regional planning and management of our delivery of water for the environment over the long term.

To learn more about our work or offer suggestions for the use of environmental water please contact your local engagement officer on M: 0419 188 430, E: [ewater@environment.gov.au](mailto:ewater@environment.gov.au)



The Edward River



# MID-MURRAY REGION



Australian Government  
Commonwealth Environmental Water Office

The Mid-Murray region extends downstream from Hume Dam, near Albury, to Euston Weir.

The Mid-Murray is a highly developed 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.

The Mid-Murray features a major anabranch and floodplain system, the Edward–Wakool. Tributaries in this region include the Kiewa, Ovens, Goulburn–Broken, Campaspe, Loddon and Murrumbidgee rivers and Broken Creek.

## Responding to environmental demands in 2017–18

The following plans for 2017–18 are based on careful consideration of the urgency of water needs (from year to year and over multiple years) and what we believe can be achieved, depending on water availability.

**River Murray channel:** We are planning to deliver water from Hume Dam to provide whole-of-system flows. As in previous years, water releases will be guided by rainfall and other natural triggers and started in winter.

The whole-of-system flows will be scalable so that our water delivery is responsive to seasonal and operational conditions. This means that if conditions are dry and the triggers are small, the focus will be on in-stream watering—such as varying flows and connecting with low-lying creeks and wetlands—to support the health and movement of fish and the growth of riverbank and in-stream plants.

If conditions are wetter, flows may target Barmah–Millewa Forest (within constraints to avoid impacts on others), to support floodplain plants such as moira grass and promote fish and waterbird breeding.

Flows moving through the system will be available to use for other seasonally appropriate activities, such as delivery to off-channel wetland sites (see below).

Flows moving through the Mid-Murray will also contribute to meeting environmental needs downstream in the Lower Murray, including in Hattah Lakes, the Chowilla Floodplain and the Lower Lakes, Coorong and Murray Mouth.

**Edward–Wakool waterways and wetlands:** Following the 2016 hypoxic blackwater event, the key objective in the Edward–Wakool region is to promote native fish recovery. This is likely to include contributing to in-channel base flows and freshes throughout the year in the Edward River, the Wakool River – Yallakool Creek system, the Colligen Creek – Niemur River system, and the Merran Creek system. The aim will be to maintain habitat and support in-stream plants and native fish. In non-permanent waterways, such as Murrain–Yarrien and Tuppal creeks, we will look to maintain in-stream habitat, particularly water quality and plants.

In the event of poor water quality, environmental watering to provide refuge habitat for native fish and other aquatic animals will be a continuing priority, where it is feasible and effective.

**Gunbower Creek:** As in previous years, we will contribute to year-round variable flows to mimic natural flows and support the survival of juvenile fish, stimulate movement of native fish and aquatic invertebrates, and transport carbon between Gunbower Creek and Gunbower Forest.

**Gunbower–Koondrook–Perricoota Forest:** It is unlikely that Commonwealth water will be delivered to Gunbower Forest in 2017–18, because of low demand following several watering events in previous years and because of the need to resolve issues about potential third-party impacts.

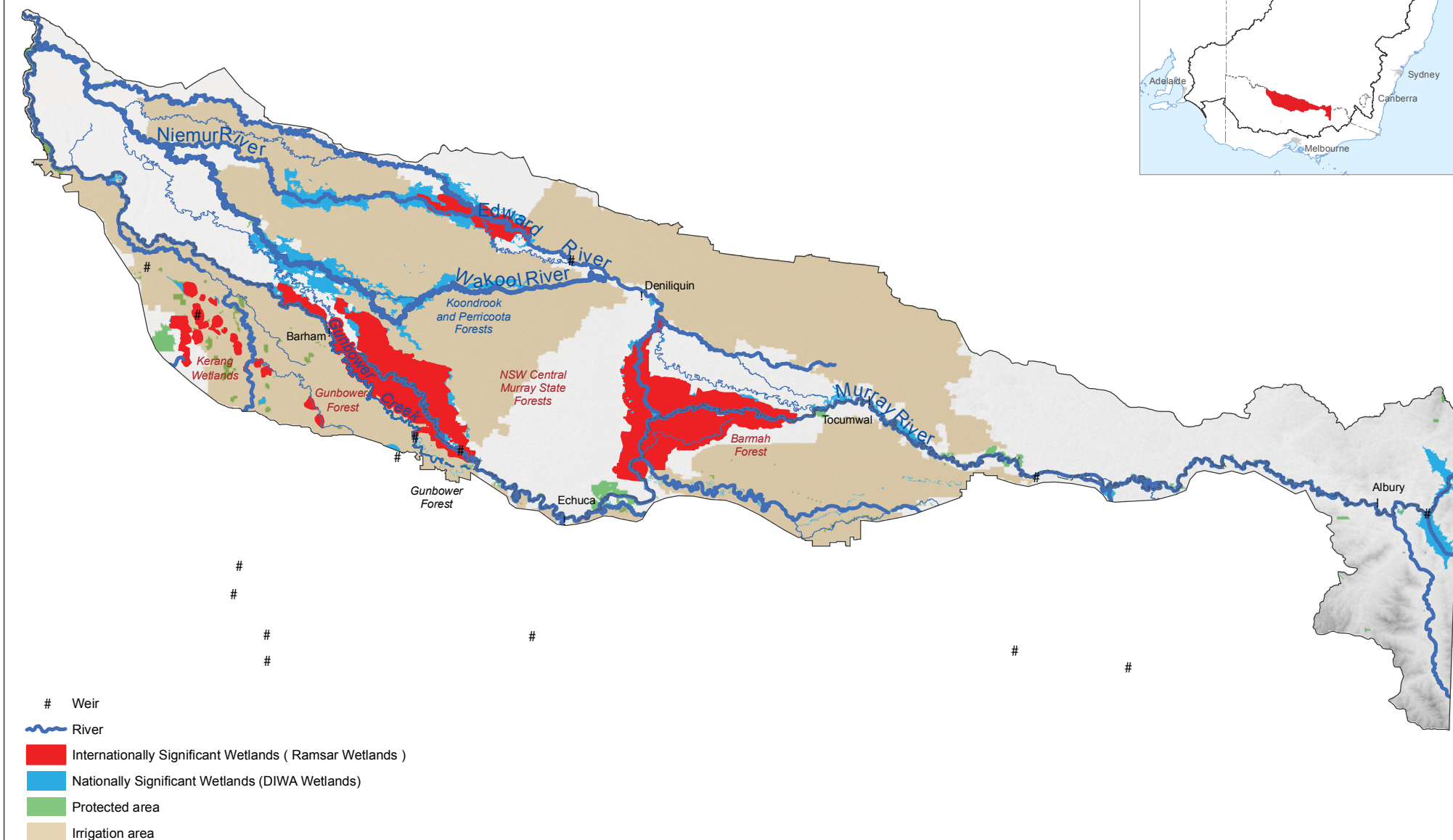
**Central Murray off-channel wetlands and ephemeral creeks—Hume to Euston:** We anticipate that the demands of native fish and vegetation in the permanent and semi-permanent wetlands will largely be met by other water holders in 2017–18. We may contribute water to several wetlands, consistent with local planning processes managed by delivery partners.

**For more information on our planning process, see the 2017–18 Portfolio Management Plan for the Mid-Murray region at [www.environment.gov.au/water/cewo](http://www.environment.gov.au/water/cewo)**



Water inundates river redgums at Gunbower Creek

### Mid-Murray Region



## 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 wildlife species.

**Full monitoring reports are available on our website:**  
[www.environment.gov.au/water/cewo/catchment/mid-murray/monitoring](http://www.environment.gov.au/water/cewo/catchment/mid-murray/monitoring)

### 2016–17

#### Preliminary results from monitoring

##### *Barmah and Millewa forests*

Environmental watering supported waterbird nesting in Barmah–Millewa Forest in spring 2016. Thousands of pairs of white and straw-necked ibis were observed, as well as large numbers of royal spoonbill, Australasian darter, cormorants (little pied, little black and great), nankeen night-heron, eastern great egret and intermediate egret. Moira grass was observed in areas from which it had previously disappeared, although its growth and flowering looks to be patchy.

##### *Gunbower Creek system*

For a number of years, environmental water has been used to provide base flows in Gunbower Creek over the winter and a high stable flow during spring. The winter base flows help adult fish to stay in good condition and be ready to move and spawn in spring. The spring flows are important to allow Murray cod to spawn, to protect their nests and to enable larvae to emerge and drift downstream. Since the implementation of native fish flows in Gunbower Creek, native fish numbers and diversity have continued to improve. The average number of Murray cod captured in 2016 was higher than in previous years.

##### *Edward–Wakool system*

In response to the hypoxic blackwater event in late 2016, large volumes of water were delivered into Edward–Wakool waterways to provide refuge habitat for native fish. While the hypoxic blackwater killed many large Murray cod, local anglers have reported that numbers of Murray cod remain good in some areas. This will help the population to recover in future years. The high flood flows also resulted in large numbers of carp.

Our understanding of the role that the Edward–Wakool system plays for native fish continues to improve. For example, golden and silver perch may be using the Edward–Wakool as a place for young fish to grow up before moving back into the Murray system to spawn elsewhere. Merran Creek, where the use of environmental water was approved for the first time in 2016–17, may be critical in providing movement corridors for native fish like silver perch.

### 2013–16

##### *Barmah and Millewa forests*

Water directed to the Barmah and Millewa forests in 2015–16 contributed to the growth of moira grass and supported breeding of over 1000 pairs of waterbirds, including white and straw-necked ibis, spoonbills, eastern great egrets, nankeen night herons, Australasian darters and little pied cormorants. A significant proportion of the global population of Australasian bitterns and little bitterns were inhabiting the forests and found to be breeding. This watering action also contributed to the spawning of golden and silver perch.

##### *Edward–Wakool System*

Murray cod require stable flows of sufficient depth for spawning. Monitoring in parts of the Edward–Wakool system, such as Yallakool Creek has shown that providing higher flows with the aim of inundating additional spawning habitat (such as snags) did not result in increased spawning. Mapping of fish habitat in this system is being considered, especially in the sites being monitored, to help determine the relationship between flow type, habitat availability and targeted outcomes such as spawning and recruitment.

Recruitment means the survival of a species through all life stages and into the next generation.

The survival of young Murray cod may be more directly affected by lack of food than by inadequate flows. The lack of bank-full and overbank flows in the Edward–Wakool is limiting nutrient and carbon inputs, which drive the supply of food for fish. However, flows through Barmah–Millewa, Koondrook–Perricoota and Werai during the cooler months could provide these critical inputs.

In-stream aquatic plants are responding well to the current pattern of flows, particularly the slower falls in flow levels. This is leading to other potential benefits, including providing habitat for aquatic animals.