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

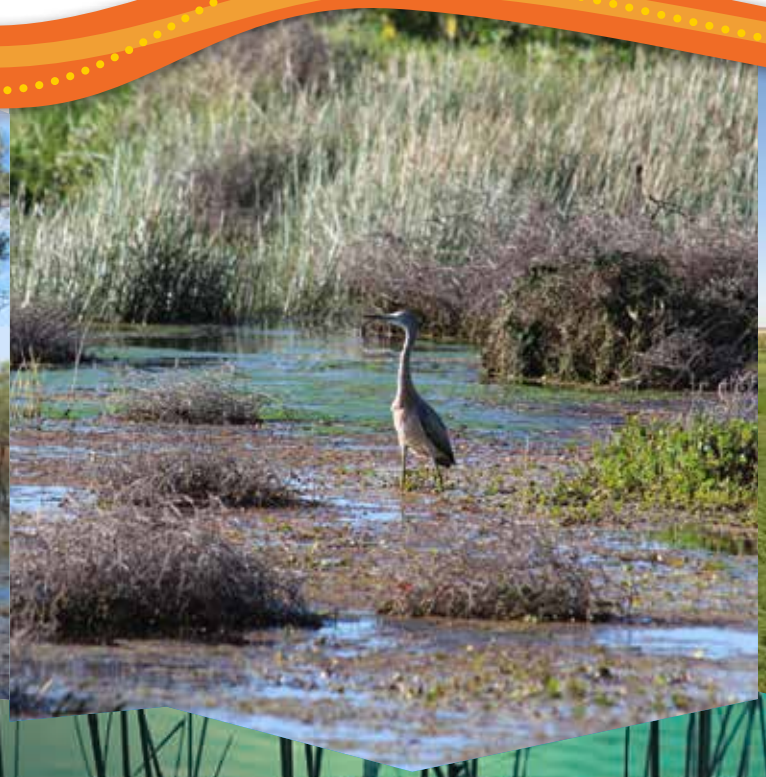
Australian Government

Commonwealth Environmental Water Office

RESTORING AND PROTECTING THE

MACQUARIE RIVER VALLEY

2017–18 SNAPSHOT



Above: Coolibah, Lower Macquarie
Cover: Louden's Lagoon in the Macquarie Marshes, 2017 White faced herron in the Macquarie Marshes
Back cover: White faced herron in the Macquarie Marshes

All images by Commonwealth Environmental Water Office unless noted otherwise.

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 Macquarie River Valley contains diverse and rich natural environments that support domestic water use, agriculture, agribusiness, tourism and recreation, mining, viticulture, and Aboriginal cultural values and practices.

Locations of particular environmental significance include internationally important sites in the Macquarie Marshes—the northern and southern nature reserves and privately owned wetlands on the Wilgara and U-Block properties.

The valley contains diverse vegetation types, including river red gum woodland, water couch grasslands, coolibah and black box woodlands, lignum swamps, reed swamps, cumbungi and river cooba. This vegetation provides valuable habitat for numerous native species of birds (211), fish (56), frogs (15), mammals (eight), and reptiles (56).

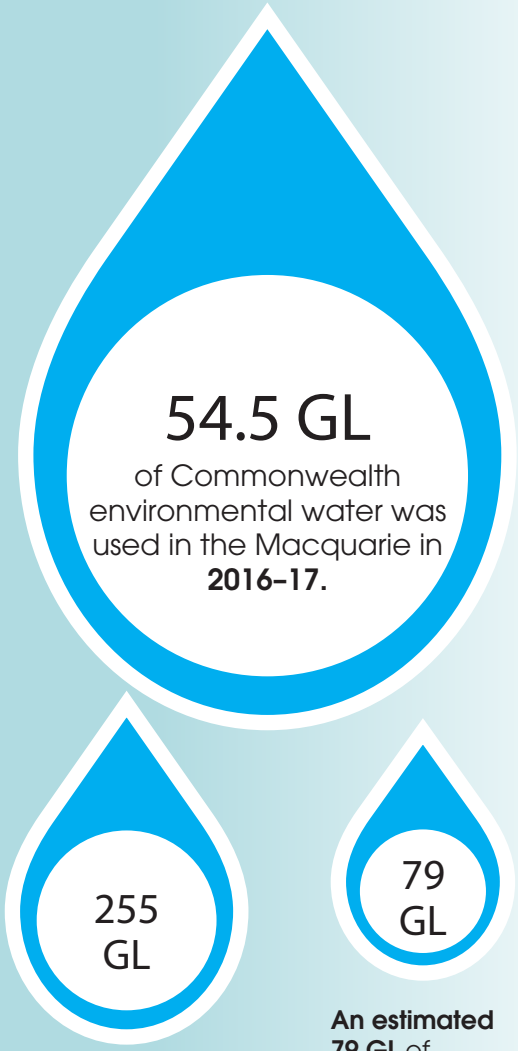
The Aboriginal people of the upper and middle Macquarie catchment are the Wiradjuri, whose nation is the largest of the Aboriginal nations in New South Wales. On the plains, the Bogan River forms the boundary between the Ngemba and Ngiyampaa nations to the west and the Wayilwan Nation in the east. The country of the Wayilwan people takes in most of the Castlereagh catchment. The north-east corner of the Castlereagh catchment, around the Wurrumbungles is the traditional land of the Gamilaroi.

Commonwealth environmental water is managed in partnership with state and local delivery partners to support rivers, floodplains and wetlands. In particular, water delivery may target sites that support nationally listed threatened species under the *Environment Protection and Biodiversity Conservation Act 1999* and sites that are of international importance. This water contributes to achieving 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 in the Macquarie River, and contribute to increased connection with the Barwon-Darling system.
- Maintain the current extent of water-dependent vegetation, and maintain condition and improve recruitment of river red gum, black box and coolibah communities.
- Maintain the extent and condition and increase the period of growth of common reed, cumbungi and water couch communities in the Macquarie Marshes.
- Maintain the extent and improve the condition of lignum shrubland communities.
- Maintain the current species diversity and increase the abundance of waterbirds.
- Prevent loss of native fish species by supporting regular recruitment (for short-, medium- and long-lived species) and increased movement and distribution. Recruitment means the survival of a species through all life stages and into the next generation.

Typha at Buckiinguy Swamp



Approximately **255 GL** of Commonwealth water was delivered in the Macquarie **between 2009–10 and 2016–17**.

An estimated 79 GL of Commonwealth environmental water was **carried over** into 2017–18 in the Macquarie.

To date, no water allocations have been sold or purchased in the Macquarie River Valley.

ML = megalitre = 1 million litres GL = gigalitre = 1000 megalitres

Water for the Macquarie River Valley to date

Delivery of water for the environment in this region is planned and managed by the Commonwealth Environmental Water Holder and the New South Wales Office of Environment and Heritage. The Macquarie Cudgegong Environmental Flows Reference Group provides important local advice. This is part of the implementation of the Murray–Darling Basin Plan.

A combination of Commonwealth and New South Wales water delivered to the Macquarie River and Macquarie Marshes since 2009–10 has contributed to the inundation of core wetland areas and supported vegetation, fish and waterbirds.

Environmental water played an important role during a hot, dry period between spring 2012 and autumn 2016 in supporting native fish in the Macquarie River and wetland vegetation in core areas of the Macquarie Marshes.

In the spring of 2016, water was delivered to support a waterbird breeding event in the Macquarie Marshes following the return of wetter conditions.

In the autumn of 2017, flows were delivered to allow native fish to move within and between habitats in the Macquarie and Barwon catchments.

Higher flows since the spring of 2016 have started to restore the resilience of river and wetland environments in the Macquarie catchment.

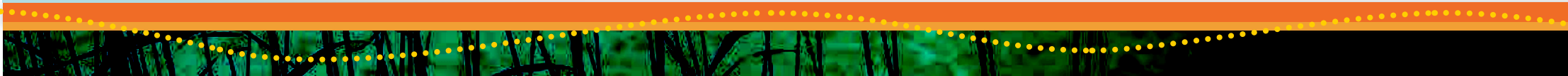
Supplying water for the environment

The water acquired by the Australian Government through investment in more efficient irrigation infrastructure and other measures, enables the Commonwealth Environmental Water Holder to reinstate some of the river flows needed to restore and protect the riverine and wetlands systems throughout the Basin's irrigation districts.

This water can be used to supplement river flows, rainfall events and water provided for the environment by the New South Wales Office of Environment and Heritage.

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 year (`carryover')
- trade (buy or sell water) for equal or greater environmental benefit.



Our partners

The best approaches to managing water for the environment involve local knowledge and the latest science.

Commonwealth environmental watering is planned, delivered and managed in partnership with people and organisations in the Macquarie River Valley. Partner organisations include:

- the New South Wales Office of Environment and Heritage
- the Macquarie Cudgegong Environmental Flows Reference Group
- WaterNSW
- the New South Wales Department of Primary Industries
- the Murray–Darling Basin Authority.

The Commonwealth Environmental Water Office regularly attends community forums, events and committees in the catchment. 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. For example, we are working with the Ngiyampaa-Wayilwan to consider potential Aboriginal cultural benefits from environmental watering actions.

To learn more about our work or offer suggestions for the use of environmental water in the Macquarie River Valley, please contact your local engagement officer on M: 0437 141 495 or email ewater@environment.gov.au

Junction of the Macquarie and Barwon rivers

MACQUARIE RIVER VALLEY

Australian Government
Commonwealth Environmental Water Office

The Macquarie River begins above Bathurst and flows into Burrendong Dam, through the iconic Macquarie Marshes and into the Barwon River.

Water in the Macquarie River system is regulated by two water storages, Burrendong Dam and Windamere Dam, which supply water for irrigation, stock, domestic and environmental needs along the Macquarie River, Cudgegong River and lower Bogan River and provide significant flood mitigation.

The Macquarie Marshes is one of the largest and most important wetlands in the Murray–Darling Basin. Approximately 200,000 ha of the marshes are listed as nationally important, and approximately 19,000 ha are listed as internationally significant under the Ramsar Convention. The marshes are made up of freshwater channels and streams with semi-permanent and ephemeral swamps and floodplains. They are an important breeding site for colonial waterbirds.

Other important assets in the Macquarie River Valley include the Macquarie River between Burrendong Dam and the Macquarie Marshes, and downstream of the marshes to the Barwon River. The creek system to the west of the marshes (such as Marra Creek and Lower Crooked Creek), also provides important connections to the Barwon River.

Ibis flying over Monkeygar Swamp, Macquarie Marshes. Credit: NSW Office of Environment and Heritage

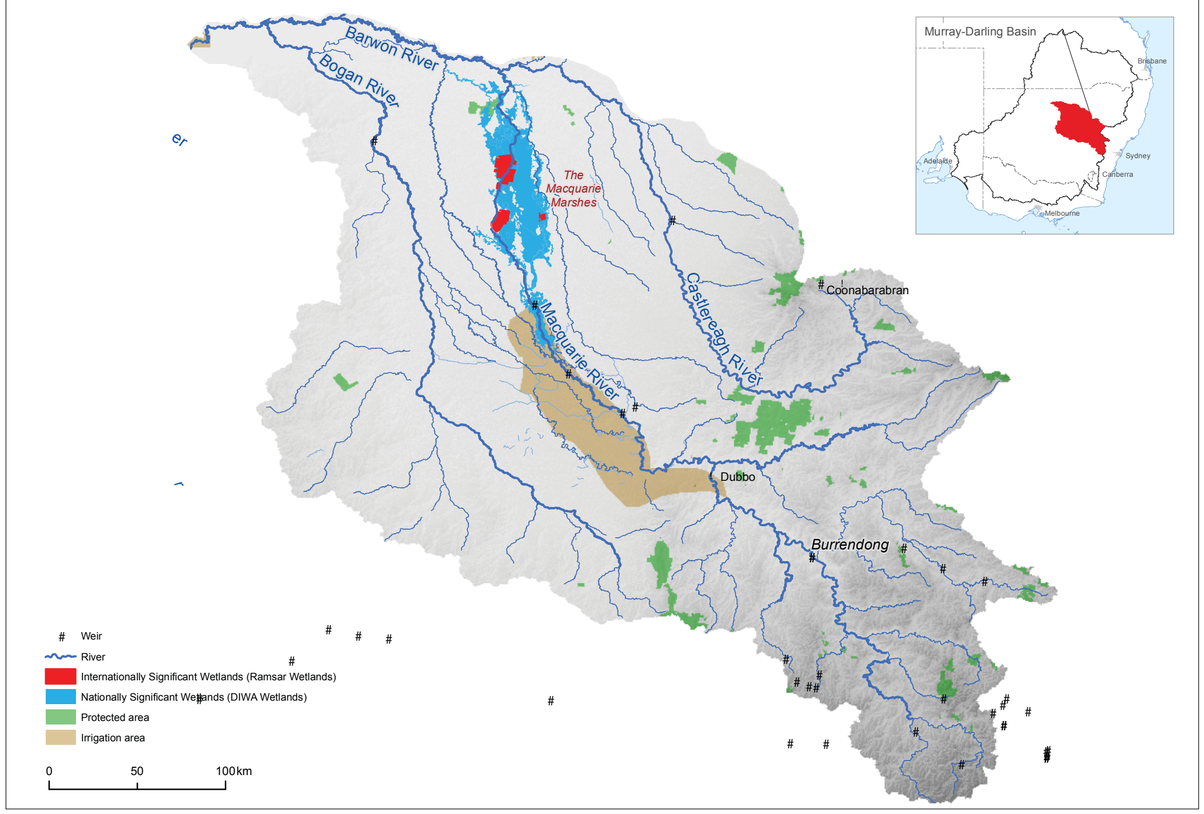
Like all water managers, the Commonwealth Environmental Water Holder must consider variable seasonal conditions.

Managing water for the environment involves careful consideration of the urgency of environmental demands each year—and over multiple years—and what can be achieved depending on water availability.

Following three years of dry conditions in the Macquarie River Valley, water availability increased substantially in 2016–17, with high rainfall and inflows into Burrendong Dam resulting in an increase in water allocations to 100 per cent. As a result, in 2017–18 we could:

- deliver water to the Macquarie Marshes to inundate up to 19,000 ha of wetland vegetation (including reeds, water couch, mixed marsh, river red gum forest and river cooba). This would help to support the recruitment of vegetation that was flooded in 2016–17; provide habitat for waterbirds, fish and frogs; maintain soil moisture and groundwater systems; and build resilience in the wetlands to help them survive if conditions become drier. We would also manage this action to support opportunities for the breeding, recruitment and dispersal of native fish.
- deliver water to the Macquarie River to connect the lower Macquarie River and the Barwon River, should the opportunity arise. This would enable native fish to move between the two river systems.

Macquarie River Valley



Responding to environmental demands in 2017–18

Mid-Macquarie River (Burrendong to Marebone Weir): Small flows to maintain refuges for native fish remain in high demand, as they are required continuously. These flows are often combined with other sources such as tributary flows. There is moderate demand to contribute to freshes that will support the movement and breeding of small and large native fish (such as Murray cod and eel-tailed catfish).

Lower Macquarie River (Macquarie Marshes to Barwon River): There is moderate to high demand for water to connect the Macquarie Marshes and lower Macquarie River with the Barwon–Darling system. This demand was met in 2016–17 but only partially achieved between 2012–13 and 2015–16.

Macquarie Marshes (reed beds, lagoons, mixed marsh, water couch): There is high demand for water for these vegetation communities, as they require annual watering. Watering of the reed beds in the Northern Marshes and at Monkeygar would continue to support their recovery following fires in 2015–16.

Macquarie Marshes (reeds, water couch, mixed marsh, river red gum forest, river cooba): There is moderate demand for water. Although these areas were inundated in 2016–17, dry conditions for the previous three years mean that watering is required again in 2017–18 to support vegetation recruitment and build resilience.

Macquarie Marshes (river red gum woodland, river cooba, inner coolibah woodland): There is low demand for water following sufficient inundation in 2016–17. Watering may be required again in the next two to three years to maintain condition.

Macquarie Marshes (outer river red gum, woodland, coolibah and black box): There is low demand for water following sufficient inundation in 2016–17. Watering may be required again in the next few years to maintain condition.

Distributary creeks: There is low demand for water, as demands were met during wet conditions in 2016–17. These creeks may require further watering in the next one to three years to maintain condition.

For more information on our planning process, including the 2017–18 Portfolio Management Plan for the Macquarie River Valley, visit www.environment.gov.au/water/cewo

Outcomes snapshot

Monitoring and evaluation activities are helping to identify what is working and what is not. These results are considered as part of the planning and decision-making processes of the Commonwealth Environmental Water Office and our state and local delivery partners.

Five short-term intervention monitoring projects have been undertaken in the Macquarie catchment since 2014–15 to assess the response of native fish to environmental watering in the Macquarie River, and to monitor a major colonial waterbird breeding event in the Macquarie Marshes. The Macquarie Marshes has also been selected as a priority research site for the Murray–Darling Basin Environmental Water Knowledge and Research Project. Details of these monitoring projects are available on our website: **www.environment.gov.au/water/cewo/catchment/macquarie/monitoring**

Most environmental flow monitoring in the Macquarie catchment is done by the New South Wales Government. The results from monitoring since 2008 provide information on the responses to environmental watering actions, and on changes to the Macquarie Marshes over time.

2015–16

- Water was delivered to the Macquarie River and Macquarie Marshes, which helped to increase connectivity along the river and through the marshes system.
- An estimated 10,145 ha of wetland vegetation, including reed beds and some river red gums, in the northern and southern Macquarie Marshes, were inundated by the environmental flow. This resulted in sprouting of reeds and growth and flowering of water couch, which provide important feeding and nesting habitat for waterbirds.
- The flow provided refuge and foraging habitat for many waterbird species, including the nationally threatened Australian painted snipe and the Australasian bittern, which were observed in spring. Inundated lagoons and water couch were particularly important areas for supporting waterbirds.
- The water delivered also helped to support the breeding and recruitment of some opportunistic species of marsh frogs.

2014–15

- Environmental water delivery contributed to connecting the Macquarie River channel (downstream of Burrendong Dam) and Macquarie Marshes wetlands. The result was both longitudinal connectivity (along the river) and lateral connectivity (between the river and the floodplain).
- The flow helped to maintain an estimated 7,683 ha of semi-permanent wetland vegetation (reed beds, water couch, mixed marsh communities) and river red gum woodlands of the northern and southern Macquarie Marshes, with a positive groundcover response in core wetland areas that were inundated.
- The watering provided access to breeding and refuge habitat for a variety of waterbirds, including four shorebird species that migrate internationally—sharp-tailed sandpiper, marsh sandpiper, common greenshank, and Latham's (Japanese) snipe.
- The environmental flows increased longitudinal connectivity and—with appropriate water temperatures as a result of the timing of the flow and the cold-water pollution mitigation curtain at Burrendong Dam—supported recruitment of native fish species including the nationally listed Murray cod and the New South Wales listed eel-tailed catfish. These species are also listed as important species in the Basin-wide Environmental Watering Strategy.