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 UNREGULATED RIVERS OF THE

NORTHERN BASIN

2016–17

Above: Aboriginal paintings at Mount Grenfell, Aboriginal historic site
Cover: Narran River
Back cover: Narran Lakes

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

The unregulated rivers of the northern Basin – including the Condamine-Balonne, Warrego, Moonie and Barwon-Darling river systems – contain diverse and rich environments. These rivers support many unique plants and animals as well as domestic and agricultural water use, cultural values and practices of local Aboriginal Traditional Owners, and tourism and recreation.

This vast network of rivers and channels spread across south-west Queensland and north-west New South Wales join to form the Barwon-Darling River, which flows for around 1900 km through semi-arid country to the junction with the Murray River.

Rainfall in the elevated (`headwater') parts of these catchments is the main source of flows. Rainfall in the headwaters is highly variable, and as a result, runoff and river flows in the northern unregulated rivers are highly variable. This of course means that the amount of water available to the environment and the many unique native species, as well as for food and fibre production, varies considerably from year to year.

For most of their length, these rivers run like a maze of channels across a very flat landscape. Rainfall and runoff is much lower in this flat landscape. Floodwaters spread out and this has created extensive floodplains, complex channels and large areas of wetlands, which are home to unique plants and animals that have adapted to live in an extreme environment characterised by long dry spells and occasional flooding.

The lower Balonne system, Moonie, Warrego and Paroo Rivers run for less than half of the time and typically experience periods of no flow, lasting months or even up to several years. The Barwon-Darling River relies on inflows from all the other northern rivers for its flow.

What makes a river 'unregulated'?

Many waterways throughout the northern Basin are unregulated, meaning that they do not have large dams or other man-made structures to store and control or `regulate' water availability. Instead, water flow is dependent on variable rainfall which mostly occurs in the higher parts of the catchment.

An unregulated flow event is when river flow does not come from a controlled release of water from a dam or weir (government owned or operated water storages). Rather, the flow in the river reflects rainfall and runoff from unregulated catchment areas flowing unimpeded through the system.

Major Mitchell cockatoo at Toorale. Photo: Lachlan Copeland

Fishway at Brewarrina Weir on the Barwon River

Unregulated flow events determine the volume of water available to all water users

State governments have issued unregulated water entitlements that specify when water can be extracted from rivers. In some river reaches, once the river rises to the specified level, entitlement holders can start pumping. In other areas (including the Lower Balonne and Border Rivers) river managers first must declare an unregulated access period and may specify the period over which water can be pumped or the volume available to each entitlement holder.

Unregulated licences can also specify daily, annual or multi-year use limits. Together, these access conditions set a ceiling on how much water can be extracted from a particular flow event and over the long-term.

Many water users hold unregulated entitlements in the northern Basin. The Commonwealth Environmental Water Holder manages volumes of unregulated entitlement across the region (around 121 gigalitres in long term average annual yield terms at mid 2016).

High levels of in-stream use is likely only in very wet years where there are large floods that meet entitlement access conditions for long periods. Just like other water users, the actual volume of Commonwealth environmental water available, depends on the magnitude and pattern of unregulated flow events that occur during the year, and on conditions of the water entitlements.

Water availability

The volume of water available to communities, food and fibre producers and unregulated entitlements held for environmental purposes, will be in proportion to the amount of water flowing in rivers and streams following rainfall. When setting the access conditions of unregulated entitlements, state governments take the needs of the environment into consideration.

The majority of water used by water entitlement holders in the northern unregulated rivers is pumped directly from rivers, or from water that breaks out of rivers, onto the floodplain during unregulated flow events. Large scale irrigation enterprises in the region generally extract water when the opportunity arises into large on-farm storages (‘ring tanks’) for later use according to crop requirements.

Barwon-Darling River

Moonie River

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

The Commonwealth Environmental Water Office regularly attends community forums, events and committees within the catchments. We 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 to learn more about our work or offer suggestions for the use of environmental water locally.

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Near Culgoa bridge

Brolga and their chicks at Toorale. Photo: Lachlan Copeland

Ibis and waterbirds on the Moonie River

THE UNREGULATED RIVERS OF THE NORTHERN BASIN

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Specific volumes of water dedicated to the environment, at the right time, helps to restore the health of rivers, floodplains and wetlands as well as native flora and fauna.

Why is water set aside to manage environmental needs?

The frequency and volume of water available to sustain the rivers, floodplains, lakes and wetlands of the northern Basin have been affected by the diversion of water to support domestic water use and agriculture. This affects habitat, key breeding sites and drought refuges, threatening the survival of the many native animals, plants, birds and fish unique to the region.

The region has a number of sites that are important for their environmental values.

The **Lower Balonne River** floodplain covers two million hectares in Queensland and New South Wales and supports the largest number of wetlands of any catchment in the Basin.

The native grasslands and coolibah woodlands on the floodplain are some of the most extensive in Australia. The distributary channels provide habitat for many aquatic plants, animals and threatened fish such as silver perch and Murray cod. Permanent waterholes within these channels act as vital refuges during dry periods, with many species of fish, frogs and invertebrates persisting in these pools until reconnecting flows occur.

Narran Lakes is a terminal wetland system (water does not flow through the wetland back into the Barwon-Darling river system) of the Narran River within the Lower Balonne system. It is an internationally significant site for waterbirds, recording some of the largest and most diverse waterbird breeding events, and the highest densities and greatest abundances of waterbirds in Australia. The lignum shrub lands in the Narran Lake Nature Reserve are some of the largest undisturbed communities of their type in New South Wales. The Lakes are of cultural and ecological significance to Aboriginal people, including as a source of food and medicine, and a meeting place.

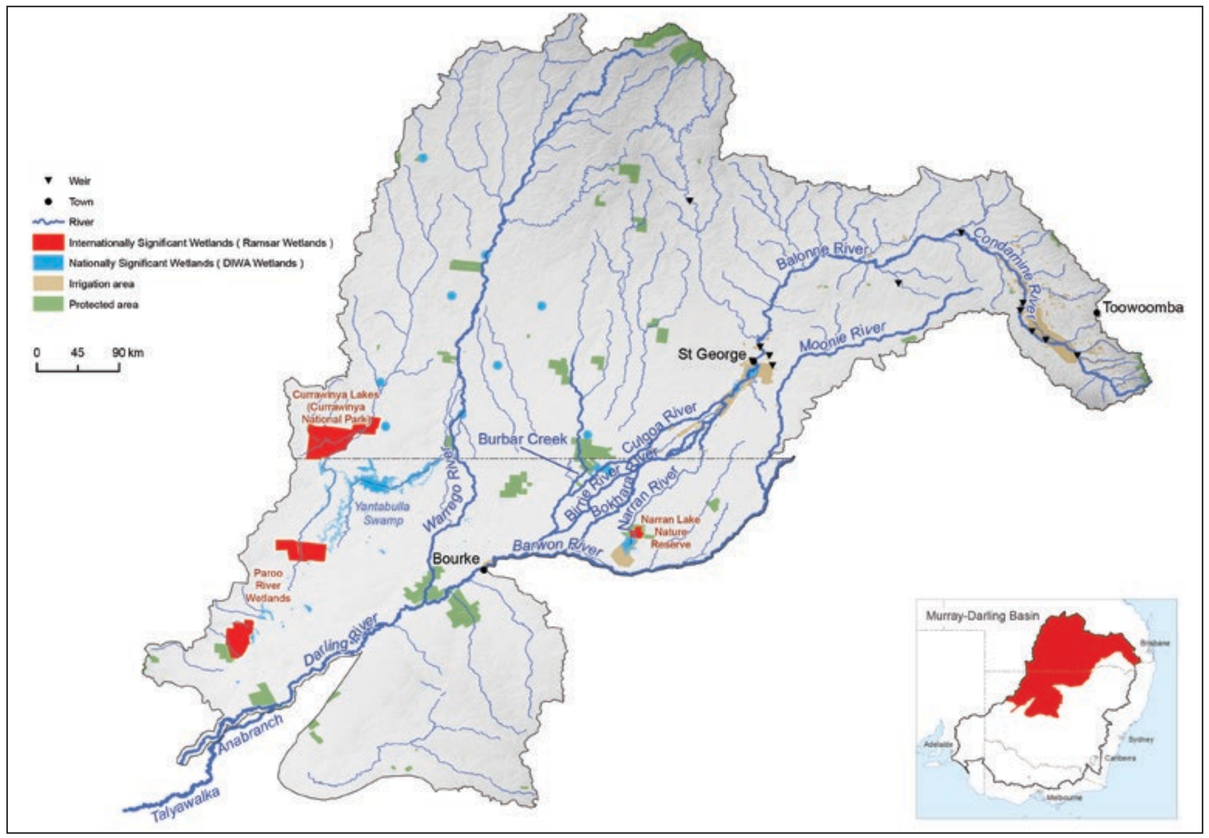
The Barwon-Darling River connects the lower floodplain rivers, lakes and wetlands in the northern Basin, providing a critical dry period refuge and movement corridor for fish and waterbirds. Its diverse in-stream habitats and hundreds of wetlands in the anabranches, floodrunners, billabongs, distributary channels and floodplain lakes support a significant native fish community, turtles, mussels, shrimp and other aquatic species. Lakes and wetlands along the floodplain provide waterbird breeding sites and staging posts for migratory species.

The Talyawalka Anabranch-Teryaweynya Creek supports many thousands of waterbirds when inundated and is known for its coolibah and blackbox vegetation.

The Warrego catchment along with the Condamine-Balonne supports the largest area of wetlands of any catchment in the Murray-Darling Basin, including lignum swamps, flood channels and waterholes, black box and spike rush swamps, claypans, freshwater lakes and saline lakes. The nationally significant **Warrego River Waterholes** near Charleville are an important breeding area for native fish including Murray cod and silver perch. The **Yantabulla Swamp** is a mosaic of channels, floodways and wetlands within the Cuttaburra Creek system, that consistently supports large numbers and a high diversity of waterbirds and when flooding provides breeding sites for ducks and colonial waterbirds.

The **Warrego Western Floodplain** at Toorale near the junction of the Warrego and Darling rivers, is a large wetland covering over 10,000 hectares. The Western Floodplain supports diverse floodplain and wetland vegetation communities and provides habitat for numerous waterbird species listed as threatened under Australian and state government legislation or in migratory bird treaties.

The **Moonie River** has relatively long and deep waterholes that are critical for sustaining healthy native fish populations in (the often) long periods between flows in this system. The lower catchment supports many wetlands.



Strategies to meet the environmental needs of the northern unregulated rivers

Passive management

Water that becomes available from the unregulated entitlement managed by the Commonwealth Environmental Water Holder is mostly left in-stream to restore some of the water flows needed for aquatic and floodplain species to survive and thrive. It is intended that this will continue to be the main method used to achieve environmental outcomes in the northern unregulated rivers.

In-stream use (or passive management) is the practice of leaving water from unregulated entitlements in the river to restore some water flows. Over time this provides more natural and variable river flows that improve the connection between rivers and floodplains helping to restore and protect riverbank and floodplain vegetation, and waterbird and native fish populations. We have worked closely with our Commonwealth and state government colleagues to ensure that the unregulated entitlements that have been recovered in the northern Basin are the right ones that will provide flows that contribute to Basin Plan long term environmental outcomes.

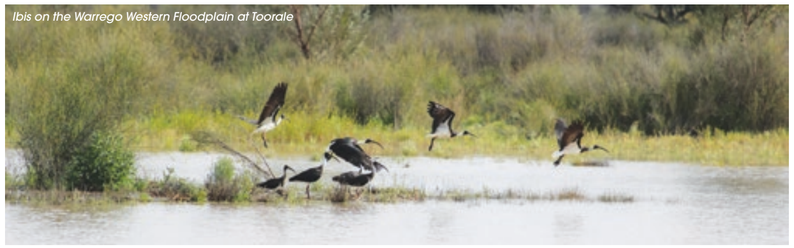
Outcomes snapshot

Monitoring and evaluation activities are helping to identify what is working and what is not, with the result considered as part of the planning and decision-making process undertaken by the Commonwealth Environmental Water Office and our state and local delivery partners.

Full monitoring reports are available each year on our website: **www.environment.gov.au/water/cewo/catchment/northern-unregulated-rivers/monitoring**

2014-15 – Junction of the Warrego and Darling

- The connection between the Warrego River and Western Floodplain was increased, providing additional habitat for aquatic animals and allowing for the exchange of organic matter and nutrients.
- Environmental water contributed to flows in the Warrego and Darling rivers, breaking periods of low flow and inundating habitats that are important for nutrient cycling within the river channels.
- The international protected eastern great egret, black frontal dotterel, grey teal, pink eared duck, herons, brolga and Australian grebe benefited from the inundation of the Western Floodplain
- Inundation of the Western Floodplain persisted for over eight months and supported a diverse and unique range of microinvertebrates including copepod crustaceans, seed shrimps and roundworms.
- Barking frog, spotted marsh frog, Peron's tree frog and desert tree frog also benefited.
- Inundation of 37 hectares of key communities on the Western Floodplain, positively influenced plant diversity and cover, supporting the growth of native herb species such as river mint and slender knotweed.


Ibis on the Warrego Western Floodplain at Toorale

Active management

The Commonwealth Environmental Water Office is also investigating options for more active use of Commonwealth unregulated entitlements including the purchase of temporary water or use of private infrastructure to further enhance unregulated flow events and enable varying of the timing, rate and proportion of flows.

Active management approaches will be used to make a more targeted contribution to specific environmental needs. Examples could include ensuring that a flow reaches the end of a river channel to achieve critical inflows into a terminal wetland, or enhancing flows to enable fish passage over an extended river reach. Active management would only be used occasionally to complement the ongoing in-stream use of permanent unregulated entitlements.

Some principles we are considering to guide where active management could be used are:

- Outcomes should be able to be significantly improved, beyond what could be expected from existing in-stream use.
- The action could contribute to the Basin-wide Environmental Watering Strategy outcomes or Annual Environmental Watering Priorities set by the Murray-Darling Basin Authority, and is cost-effective.
- The action could support important flow indicators that are not met or are unlikely to be met over the longer term via passive use alone.
- Unacceptable impacts on third parties (such as other water users or landholders) can be avoided or minimised.

Active management opportunities in unregulated systems are limited but could include the deliberate altering of the timing, rate or proportion of water flows to meet important flow targets for the rivers, floodplain and wetlands, through the following actions:

- The purchase of temporary water from willing sellers, or the use of water stored in private infrastructure such as ring tanks, channels, pumps and weirs to achieve ecologically important flow targets.
- Delivering environmental water to an off-stream wetland or site through private infrastructure, or transferring water between river channels.
- Diverting environmental water into on-farm storages and releasing at a later time to alter the timing, location or rate of flow of an event, to achieve improved environmental outcomes.

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

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*, 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). These longer-term outcomes are summarised below:

Increase freshes and bank-full events in the Border Rivers and Barwon-Darling and freshes and low floodplain flow events in the Lower Balonne. Maintain current levels of connectivity in the Moonie, Nebine and Warrego.

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

Maintain current forest and woodland vegetation, including of river red gum, blackbox, coolibah, lignum shrublands and non-woody vegetation communities. Increase growth for vegetation communities within river corridors, wetlands and low-lying floodplains.

Maintain the diversity of waterbirds and increase the population through improved breeding opportunities.

Restore and maintain the conditions needed for native fish spawning, movement between areas, and the health of their communities.


Pelican in the northern unregulated system