

# The Gwydir catchment and the Long Term Water Plan explained



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The importance of the Gwydir Wetlands (the Gingham, Lower Gwydir and Mallowa watercourses) is recognised locally, nationally and internationally for its significant colonial waterbird breeding habitat. Four wetland parcels are listed under the Gwydir Wetlands Ramsar site.

The Lower Gwydir wetlands also support the state's largest stand of marsh club rush, which is listed as a threatened ecological community under NSW legislation.

## The Gwydir catchment



**Carole Creek.**  
Photo: J Humphries/OEH.

The Gwydir catchment is in northwest New South Wales (NSW). It covers 25,596 square kilometres and forms part of the Murray-Darling Basin.

Gomeroi Nation people (also known as Gamilaraay and Kamilaroi) are the traditional inhabitants of the Gwydir catchment. They maintain their connection with the region through sites of cultural and spiritual significance, and values such as native foods (e.g. Murray cod). There are over 160 recorded cultural heritage sites located around the Gwydir's wetlands, including burial sites, ceremonial grounds, carved and scar trees, and stone artefacts.

Today, more than 26,000 people live in the Gwydir catchment. Moree is the regional centre and smaller towns include Uralla, Guyra, Bingara, Warialda, Bundarra, Delungra, Pallamallawa and Tingha.

The Gwydir's regional economy relies on agriculture. Around fifty per cent of the catchment is used for grazing, 6 per cent for irrigated crops with around 35 per cent used for large-scale dryland cropping (particularly in the catchment's west).

## The Gwydir's freshwater assets

The Gwydir River rises in the Great Dividing Range near Uralla and flows northwest to the northern plains.

Copeton Dam between Bundarra and Bingara captures all upstream flows from the Gwydir River and its tributaries. Downstream of the dam most of the Gwydir's major tributaries, including the Horton River, and Halls, Myall and Warialda creeks, enter the river above Pallamallawa.

Near Moree, the main Gwydir River branches into four major distributaries: the Mehi River (and its associated Moomin and Mallowa creeks); Carole Creek; and Gingham Watercourse and the Lower Gwydir River at Tyreel.

Both the Mehi River and Carole Creek (via Gil Gil Creek) join the Barwon River upstream of Collarenebri. The Lower Gwydir and the Gingham become terminal wetland systems from around 50 kilometres west of Moree and only flow into the Barwon River from larger flooding events.

The system's waterways provide drought refuge, and foraging and breeding habitat for native fish, reptiles and waterbirds.

## Managing water in an altered catchment

Like many major NSW rivers, the size and timing of natural river flows in the Gwydir catchment have been altered by the construction of dams, weirs and channels that store and supply water for urban and agricultural needs.

Copeton Dam, which was built in the late 1970s, has changed downstream water regimes. The frequency, duration and timing of cease-to-flow periods, low flows and small freshes have experienced the greatest alteration.

A portion of the water that once flowed into the channels and wetlands of the Lower Gwydir River, Gingham Channel and Mallowa Creek is now diverted into the Mehi River, Moomin Creek and Carole Creek/Gil Gil systems, mainly for irrigation needs. These regulated river sections flow more permanently than they did naturally when a larger proportion of all low to high flows and floods dissipated in the Gingham and Lower Gwydir (Big Leather) watercourses.

Similarly, Mallowa Creek and its wetlands have been cut off from most natural inflows it once received due to modifications to flows and structures for irrigation development.

The Gwydir's riverine, wetland and floodplain landscape has also changed because of clearing of native vegetation for cropping and irrigation development. The Gwydir Wetlands, which once covered an area of around 220,000 hectares, has reduced by around 85 per cent.

The health of the Gwydir's remaining wetlands also declined as these areas were inundated less frequently and for shorter durations. In addition, much of the remaining wetland assets are surrounded by broadacre cropping and farming on the western floodplain.

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**Human activities  
have reduced the  
area of the  
Gwydir Wetlands  
by 85 per cent.**

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## Improving river and wetland health



**Mehi River.**  
**Photo: J Humphries/OEH**

In recent years, the NSW and Australian Governments recognised there was insufficient water to support healthy rivers and floodplains in the Gwydir catchment. This has led to several phases of water recovery for the environment.

The first phase was in 1996 with the introduction of rules for sharing river flows between water users and the environment in the Gwydir system. The rules included provision of an Environmental Contingency Allowance (ECA) of up to 25,000 ML per year in Copeton Dam, which was mainly used to provide flows to support the Gingham and Lower Gwydir wetlands. They also included a low flow protection rule for the Gingham and Lower Gwydir and a limit to extraction of tributary flow events (supplementary events) of no more than 50% of flows to be extracted for irrigation. The second phase occurred in 2004 with establishment of the first *Regulated Gwydir River Water Sharing Plan*, which legislated these rules and increased the ECA account to up to 45,000 ML per year.

Wetland extent and conditions continued to decline during the 2000s due to the Millennium drought, which limited volumes in the ECA.

A halt in the decline in the extent of wetland areas and an improvement in wetland conditions for the Gingham and Lower Gwydir has been achieved since 2011 onward. This is a result of the recovery of additional water for the environment by the NSW and Australian Governments, a period of higher natural inflows and improved availability of environmental water reserves.

Since 2012, additional areas in the Gwydir system, including Mallowa Creek and wetlands, the Mehi River and Carole Creek, have also been supported by the use of water for the environment. The Gwydir has also contributed to environmental flows in the Barwon River.

During 2007–2009, a project under the *NSW Rivers Environmental Restoration Program* replaced the network of open channels in the Gingham Watercourse and its wetlands with a 240-kilometre water supply pipeline. This infrastructure allowed OEH to begin restoring the wetlands. Today, old flow paths to historic and key habitats are reconnected and improved flooding extent and duration have been achieved. The original restoration target of 3000 hectares is now closer to 5000 hectares.



**Flooded Lower Gwydir wetlands.**  
**Photo: D Albertson/OEH**

Water managers are working closely with local communities to deliver water where and when it is needed – providing benefits for plants, animals and people.

The coordination of all available water resources in the river can enhance the health of rivers and wetlands while simultaneously delivering benefits for landholders and communities.

During dry years, water management is focused on maintaining the health of key river pools and core wetland sites that are ready to bounce back when high rainfall provides flows into the river system. In wet seasons, water is managed to enhance the effects of natural flows to achieve long-term resilience within the system.

Flows to support native fish have provided opportunities for iconic species such as catfish, Murray cod and yellow belly to feed, breed and move throughout the Gwydir system.





## Introducing the Gwydir Long Term Water Plan



**Freshwater catfish.**  
**Photo: G. Schmida**

The NSW Government's Long Term Water Plan (LTWP) for the Gwydir is an important step; identifying the requirements for maintaining and improving river, wetland and floodplain health in the catchment, and recognising its connection and contribution to the overall health of the Murray-Darling Basin.

### Background to Long Term Water Plans

The Basin Plan establishes a framework for managing environmental water at the Basin and catchment-scale. The framework is designed to ensure environmental water managers work collaboratively to prioritise water use to meet the long-term needs of native fish, water-dependent native vegetation and waterbirds and co-ordinate water use across multiple catchments to achieve Basin-scale outcomes.

The *Basin-wide Environmental Watering Strategy* (BWS) and LTWPs are central features of this framework. The BWS establishes long-term environmental objectives and targets for the Basin and its catchments.

Catchment-scale LTWPs identify strategies that can be applied locally that will contribute to the achievement of the expected BWS environmental outcomes.

### Development of the Gwydir LTWP

The Gwydir LTWP is one of nine plans being developed to cover the NSW portion of the Murray-Darling Basin. Its development included five main steps.

- A catchment-wide stocktake of water-dependent environmental assets and ecosystem functions that are recognised internationally; natural or near-natural; provide vital habitat; and/or can support threatened species or communities, or significant biodiversity.
- Determining specific objectives and targets for key native fish, water-dependent birds and vegetation species and ecosystem functions in the Gwydir.
- Defining the environmental water needed to sustain and improve the health and/or extent of priority environmental assets and ecosystem functions.
- Identifying potential management strategies to meet environmental water requirements.
- Identifying other investments to address risks and constraints to meeting the long-term water requirements of priority environmental assets and ecosystem functions.

## Water for the environment

The Gwydir LTWP contains ecological objectives and targets for priority environmental assets and ecosystem functions. The Basin Plan defines priority assets and functions as those that can be managed with environmental water.

Ecological objectives have been identified for native fish, native vegetation, waterbirds, river connectivity and frogs as they respond to flow and are good indicators of river, wetland and floodplain systems health. The objectives reflect the current scientific understanding of environmental outcomes that might be expected from implementation of the Basin Plan in the Gwydir catchment (Table 1).

Targets for each ecological objective are set at five, 10 and 20-year milestones to provide a transparent means of evaluating the long-term success of management strategies.

All water in the Gwydir’s river systems has a role to play in enhancing the health of the Gwydir catchment: whether it is water delivered specifically for the environment, for irrigation, town water supply or stock and domestic purposes, or natural flows.

**Table 1 A summary of the environmental outcomes sought by the Gwydir LTWP**

Broad outcomes	Example objectives	Example targets
To maintain the extent and improve the health of water-dependent native vegetation and wetlands	Maintain and improve the viability and extent of river red gum, black box and coolabah communities, lignum shrublands and non-woody wetland vegetation such water couch and march club-rush	<ul style="list-style-type: none"> <li>• Improve the extent and condition of vegetation in core areas of the Gingham and Lower Gwydir wetlands</li> <li>• Improve the extent and condition of vegetation in core areas of the Mallowa system</li> </ul>
To maintain the diversity of waterbird species and increase their numbers across the catchment	Restoration of habitat for waterbirds to contribute to recovery of waterbird populations across the Murray-Darling Basin	<ul style="list-style-type: none"> <li>• Support the successful completion of colonial waterbird breeding</li> <li>• Provide foraging habitat for waterbirds</li> </ul>
To maintain the diversity and improve the population of native fish in the catchment	Increase native fish distribution and abundance, and ensure stable population structures	<ul style="list-style-type: none"> <li>• Provide improved conditions for native fish recruitment in the Gwydir, Mehi and Carole systems</li> <li>• Replenish refuge waterholes for native fish</li> </ul>
To maintain and protect a variety of river, wetland and floodplain habitats and support the movement of nutrients throughout the river system	Various objectives relating to instream and floodplain refuge and habitat, supporting productivity and the lifecycles of water-dependent biota, and connecting riverine and floodplain systems.	<ul style="list-style-type: none"> <li>• Restart flows after cease-to-flow conditions in the lower river to reduce the risk of hypoxic blackwater and fish kills</li> <li>• Contribute to improved flows in the Barwon River</li> </ul>



Baby egrets. Photo: D Albertson/OEH

## Managing water for egrets – an example

The Gwydir Wetlands provide the combination of food, vegetation and flooding patterns needed to support colonial waterbird breeding.

The Gwydir LTWP details the water required to support colonial breeding events. The following example demonstrates the complexity scientist's face when defining the water required to achieve this outcome.

Egrets eat fish and frogs – therefore their food supply depends on water in the landscape. Although egrets can move between catchments to find food, it must be within their natural range if they are to survive.

Egrets are colonial nesters, meaning they will only nest in large groups in trees or other vegetation that overhangs water. Water levels must be maintained in the wetlands and under the trees until the young birds leave the nest.

Egrets only breed when there is a sustained super-abundance of prey. These conditions are triggered by inundation of healthy floodplains, which mobilises vast amounts of nutrients that can feed all levels of the food chain. If conditions are not suitable, egrets will not breed.

Long periods between nesting opportunities pose significant risk to egret populations, which is why environmental water managers aim to ensure that breeding events, when triggered, are supported through to completion.

In practice, water managers might achieve this by ensuring the environmental share of Gwydir floodwaters and tributary flows are diverted to the breeding sites and by ordering available environmental water to be released from Copeton Dam. In between breeding events, water managers must ensure nesting and foraging sites receive enough water to be event-ready.

## Management strategies and complementary investments



**Magpie geese in flight.**  
Photo: D Albertson/OEH

The LTWP identifies management strategies and investments that will complement the ecological objectives and targets it aims to achieve. They include addressing cold water pollution caused by water releases from Copeton Dam, fish passage, conserving riparian, wetland and floodplain vegetation, and screening irrigation pumps to protect fish.

A critical complementary measure is resolving constraints to the delivery of environmental water in the Gwydir catchment.

The MDBA (with assistance from the Office of Environment (OEH)) has previously consulted with many of the Gwydir's wetland and inner floodplain landholders on the implementation of measures that would allow environmental water delivery to have fewer impacts and to be made during critical cropping activities without impact. While many details still need to be negotiated with landholders, initial consultation has indicated a clear willingness to work together to resolve these issues for mutual benefit. This work will continue with implementation of the Northern Basin Toolkit.

## Monitoring and evaluation

Monitoring of past environmental watering events has helped improve the way available water resources are managed to benefit native plants, animals and river functions. This work highlights the tangible outcomes that can be achieved when water is managed for improved river and wetland health.

The NSW and Australian Governments will continue to monitor the health of the Gwydir's rivers and wetland ecosystems in response to environmental watering.

Monitoring will:

- demonstrate progress towards achievement of the LTWPs objectives and targets
- inform the use and management of environmental water
- contribute to periodic reviews of the LTWP
- provide new knowledge about the Gwydir's ecology that is relevant to environmental watering.

To ensure the LTWP remains relevant and up-to-date, it will be reviewed and updated no later than five years after implementation.

## How will the LTWP be used?

The Gwydir Environmental Water Advisory Group (EWAG) provides advice on management of water for the environment in the Gwydir catchment. Its members represent First Nations, landholders, government, water users and independent environmental and scientific groups.

Input from the Gwydir EWAG helps ensure the landholder, community and cultural values of the Gwydir area are considered in environmental water management decisions.

The Gwydir LTWP will help guide and inform the work of this group. Importantly, the plan does not prescribe how environmental water should be managed in the future, rather it will help water managers and the Gwydir EWAG make decisions about where, when and how available water can be used to achieve agreed long-term ecological objectives.

The LTWP also recognises that the Basin Plan specifically requires environmental water managers to act adaptively by making timely decisions based on the best-available knowledge, and monitoring and evaluating the outcomes from water use.

