INLAND RIVERS NETWORK

Speaking up for billabongs

So what is a billabong I hear you ask ??

A billabong is a place where a swagman sits and waits until his billy boils. They are an ingrained part Australian Folklore and First Nations cultural history. They are truly unique.

Why are Billabongs Special?

A billabong is a unique type of wetland near a river with a big pool or lagoon that was shaped by the river long ago. They usually have shady trees like big old river red gums or coolibahs around the edge and can be characterised by their wetting and drying phases. Most don't always have water in them. They are their own individual ecosystems.

The most common type of billabong iis what is technically defined as an oxbow lake. These form when a meandering river changes its course and leaves part of the old channel stranded. River channels can move their position when big floods erode their banks and deposit sediment in parts of the old channel. The name is also applied to deep pools in channels through the floodplain that become an extra route for the river when its flows are very high. To fill with water, billabongs need their river to overflow through a connecting channel – some require a very high flow, others need a small flood.

Why the need to Speak Up For Billabongs

In the current water management decision making process the specific needs of billabongs have for too long been overlooked. This needs to change to ensure that these unique ecosystems can continue to be part of our cultural landscape. The neglect needs to stop. Billabongs can hold water for a long time. They are vital life-sustaining places in central and western New South Wales and across Australia and have high cultural significance for First Nations communities.

These bodies of still water provide important environmental values that support a range of native wildlife including fish, waterbirds, turtles, frogs and other aquatic species while also supporting the fringe vegetation such as river redgums, coolibahs and coobahs. These in turn provide feeding and breeding habitat for land-based birds and mammals. They all need access to water, especially in a drought.

The still water environment is distinctly different from flowing rivers with variable water chemistry, accumulation of organic matter on the bottom of the billabong and often connection to groundwater. Zooplankton and macroinvertebrate communities can be quite distinct from those occurring in flowing rivers.

This newsletter is the first of a series on billabongs: it has a specific focus on the Barwon-Darling. Follow up editions will look at the Southern Basin issues and provide more detailed information on the eological and cultural values of the iconic Aussie Billabong.

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Billabongs are unique features of the Australian landscape

Billabongs are an important cultural landscape

The word billabong is thought to be derived from the Wiradjuri language with ‘bila’ meaning river.

For Aboriginal people, billabongs, wetlands and river pools are places of life, learning, ceremony and culture. They are where children learn to swim, fish and gather food, and where knowledge is passed between generations.

“They are our nurseries,” says Gamilaroi Elder Polly Cutmore. “They are the first parts of the river as baby and children we can walk in. They are not as dangerous as rivers and where children learn their culture, how to fish, swim and collect food.”

These wetlands are also vital refuges for fish, turtles, frogs, birds and other wildlife. As pools dry more frequently, families lose access to traditional foods and places for teaching, gathering and ceremony, while wildlife loses critical habitat.

Elders say declining flows, over-extraction, large-scale irrigation, cotton farming, private dams and on-farm storages are degrading rivers and wetlands, while groundwater extraction is disrupting aquifers and natural pools.

Ecologically Billabongs are unique

A billabong provides an ecological system quite different from that of a river. Except during high flow times in the feeder river, a billabong’s waters are generally still. Cycles of rapid dilution during inundation followed by (slower) evaporation are often observed. The frequency of these cycles depends on the frequency and reliability of rainfall and the degree of management control. These cycles of inundation and evaporation produce variable water chemistry, also affected by the accumulation of organic matter on the bottom of the billabong. Billabongs have a finite existence, following an orderly ecological succession to complete siltation in the long term, while undergoing a season pattern of periodic filling and gradual drying.

Billabongs

Polly Cutmore at Mia Mia Ponds Photo: David Paulli

This environmental variation creates highly variable and sometimes ephemeral aquatic habitats in billabongs. Billabongs represent a distinct subsystem of freshwater aquatic environment where flora and fauna patterns are driven by ecological succession and colonisation. In the River Murray, zooplankton and macroinvertebrate communities in billabongs are quite distinct from those that occur in the river. It is not the lack of connectivity to the river that is the cause of such difference, rather it is the inherent physical and biological differences between the two habitats.

So why are we calling for more love to be shown for billabongs ?

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Billabongs

Unique floodplain wetlands

Billabongs filter nutrients, trap sediments, and provide crucial dry-season refuge habitats for some native fish, many birds, floodplain frogs, and rakali. They require varying flows periodically exceeding minimum heights specific to each billabongto alternate between wetting and drying phases.

Biodiversity Hotspots: Support specialized aquatic or wetland plants, macroinvertebrates, and are breeding grounds for native fauna. By expanding habitats they enable wetland and terrestrial species to rebuild populations and resilience in wet years then survive through dry years.

Drought Refuges: Some hold water longer than adjacent river channels during dry spells, keeping aquatic life and the species that feed on it alive.

Nutrient Cycling: Water enables conversion of sunlight, air and nutrients from up stream or fallen leaves into food webs that sustain surrounding land and river ecosystems.

What needs to be done?: Speaking up for Billabongs

The current water sharing plan rules need to be amended to include specific actions to address billabongs unique flow needs through vital connectivity.

Periodic flushing flows are important for water quality and ecosystem health:

Flushes toxins: High flows clear out some of the rotting organic material and stop dangerous algal blooms. Frequent flushing helps river health.

Resets salinity: Stops salt from building up as the water slowly evaporates during dry periods.

Oxygenates water: If the billabong still has water in it, fresh inputs mix the water layers and raise oxygen levels for underwater life.

Periodic flows are important for plant and animal habitats

Connects food webs: Inflows from the main river channel give river-dependent species like fish, platypus and river turtles much more habitat to feed in. They need sustained or repeated connection to return to the river

Triggers breeding: Rising water cues some fish like Golden and Spangled Perch to spawn and waterbirds to nest in surrounding trees. Others, like gudgeons, breed when the water is warm enough. All need water to remain for many months.

Sustains vegetation: Periodic rehydration keeps trees and shrubs like black box, red gums, river cooba and lignum alive through dry cycles.

Basic Flow Requirements to maintain Billabongs

Seasonal inundation: Need very high-flow pulses or small floods to connect back to the main river channel – typically in winter or spring from southern rivers and in various seasons in the north.

Wetting and Drying Cycles: Require natural drying phases to mineralise nutrients from organic matter and control invasive species, followed by refilling to trigger fauna breeding and plant growth.

Connectivity: Flow depth and duration must be enough to allow fish and other organisms to move freely between the river and the billabong

Billabong waiting for refill South of Wilcannia
Kevin Vaughan

Billabongs

Billabongs are the heart of our Darling Baaka River, of all our big inland rivers that meander across the plains. They are not only symbolic of what we love about inland Australia – a place to relax in the shade of big old red gums or coolibah trees while fishing or boiling the billy. Billabongs filled by and connecting with their river are at the heart of how our big inland rivers function to nurture frogs and native fish such as gudgeons and young Spangled Perch – producing food for the amazing Murray Cod and a host of waterbirds. They supported indigenous people for so long, since the dreaming, and can continue to support the health and wellbeing of people who live near them, and of visitors.

Inland river systems, each with its vast floodplain, are like a really big organism that have been living in their own ways for millions of years, co-evolved with all the species they nurture. Perhaps the plants and animals are their cells. The life of our inland rivers has evolved ways to function together, not just so the predatory fish don't wipe out all their prey, but so the nutrients from the falling gum leaves and the energy captured from sunlight by aquatic plants can support a food chain, so all species, little and big, breed at a time when their larvae or young will have a food supply. Each river system has a form and habits that respond to local geology and climate, and shares ways of functioning that fit the environment and its ancient species.

Rivers are the arteries and their flows are the lifeblood of the inland. Just as blood is more than water, river flows have qualities which meetthe needs of ecosystems in and along the rivers and out in the body of the floodplain - qualities needed by nature and the people of the inland, qualities like slow or faster flow, temperature patterns, what sediment, organic matter, salts or other chemistry it carries for short or longer periods, and what algae and minute animals are moving with the water.

While the movement of the water is determined mostly by gravity, when billabongs are connected to their river, they take the lifeblood in. To connect, the river needs a high flow, well up its banks. This is a turbulent flow, so billabongs provide a calm refuge which springs to life.

Fish, shrimps and other animals may have swum in. Some, like floodplain frogs, lay eggs in billabongs. Eggs of other species, such as Golden Perch, get washed in. When the lifeblood flows into a dry billabong there is a surge of life as microbes get to work releasing more nutrients from organic matter. Eggs of tiny organisms hatch and feed on the microbes. Seeds germinate and algae multiply. By the time frog spawn and fish eggs hatch there is a supply of algae, young plants and tiny zooplankton for tadpoles and fish larvae to eat, then larger plants and macroinvertebrates. Soon birds will fly in to find their food. This great pulse of life will spread out into the environment as well-fed insects, frogs, snakes and birds.

Our rivers have hundreds of billabongs. When a lot of rain in the catchment results in a high enough flow to reach some billabongs these may be connected for a day or weeks, repeatedly or rarely. The connection of billabongs to their river is naturally temporary – they fill through a low point in the riverbank that acts like a valve, opening when the river rises high enough, closing when it drops. But as the river drops, some of the water will drain back out, taking nutrients and zooplankton with it – a pulse going back out. Fish and other aquatic animals may be part of that pulse if they swim out as the pool level starts to drop, or they may be trapped.

They will have to stay in the billabong, waiting for the next time it is connected to venture out and try life in the mainstream. Or die there if it dries too soon, at least leaving their nutrients, and perhaps their eggs, for the next time the valve opens letting lifeblood into the billabongs, and generating the next pulse back to the river.

Perhaps a series of billabongs can be like a series of hearts, each contributing a pulse to the life of the whole mega-organism if they are connected.

Kate Boyd 23/8/26

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Connectivity and What it Means for Billabongs: Barwon-Darling example

There are over 300 billabongs along the Barwon-Darling/Baaka plus more along anabranches. They get most of their water from the nearby river plus very little from local runoff.

The Barwon-Darling/Baaka River depends mostly on inflows from its major tributaries which are no longer adequately connecting with it. Dams and rules permitting pumping and floodplain harvesting seriously reduce low, medium and high flows with appalling consequences.

The NSW Government appointed a Connectivity Expert Panel to advise on how to address this and is now deciding whether to adopt what was recommended (Final Report July 2024).

IRN'sNewsletter #7 May 2026 addressed initial options for implementing recommendations to: ensure ecosystems get base flows from tributaries in all seasons connecting pools through riffle zones, protect small freshes (pulses) for functions like minimising blue-green algal blooms and enabling fish to access more habitat in the river channel ensure potential flows in drought can get all the way through the Darling/Baaka for towns and ecosystem survival.

This article explains the relevance of the Panel's report to billabongs.

Three forms of connectivity

Longitudinal connectivity refers to the connections of flows along river channels, for example the maintenance and timing of flows from the tributaries into the Barwon-Darling/Baaka, and the connection that river provides between the Northern and Southern basins.

Lateral connectivity is the connection between the river and its anabranches, riparian areas, wetlands and floodplains. Billabongs rely on this lateral connectivity, with water entering and leaving the billabongs when river heights exceed the height of the bit of the riverbank that separate the billabong from the river.

Vertical connectivity is connection with groundwater, important if billabongs penetrate the local water table and when flooding raises the water table so deep-rooted trees can survive the next drought.

The Connectivity Expert Panel focussed only on longitudinal connectivity, encouraging others to further investigate lateral and vertical where needed, but some of their recommendations contribute to the lateral connectivity billabongs need.

Ecological needs for high flows

The Panel linked adequate flows to the maintenance of basic ecosystem functions. It described the ecosystem's needs for base flows that should be present nearly all the time, for small freshes and these 3 higher flow classes:

Large freshes — High-magnitude flow pulse that remains in-channel, connects most in channel habitats, provides partial longitudinal connectivity by drowning out some low-level weirs and other in-channel barriers **and may engage flood runners and inundate low-lying wetlands**. This covers a range of heights and associated flow rates (e.g. 14,000 to 29,000 ML/day at Bourke), far enough up the bank to reach a few to many billabongs[i].

Bank full flow — inundate all in-channel habitats and connect many billabongs

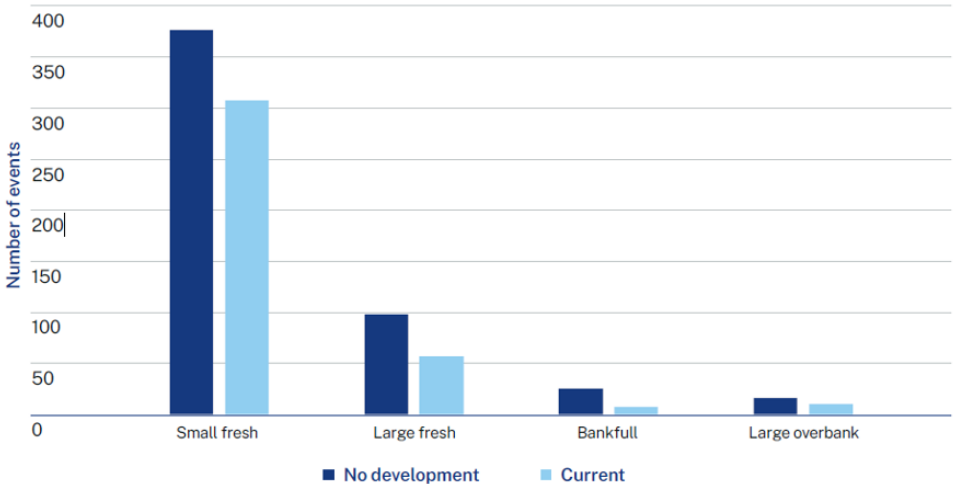
Overbank flow — Floodplain connection flows provide broad scale lateral connectivity with floodplain vegetation and wetlands

The Panel expressed concern about the extent and effects of alterations to the natural flow regime caused by reduced longitudinal connectivity, in wet seasons as well as dry seasons, particularly effects on ecological functions.

Modelling of flows show big reduction of the number of large fresh, bankfull and large overbank flow events reaching Bourke and Wilcannia, and a 90% reduction in the magnitude of the once near-annual pulses of flow in droughts (e.g. reducing large freshes to small and small freshes to very small). The Panel referred to this figure from the Western Regional Water Strategy.

Brennan S., O'Brien M., Thoms M. 2002 Physical character and flow criteria for wetlands along the Barwon-Darling River. Cooperative Research Centre for Freshwater Ecology Technical Report

Figure 21. Modelled change in total number of different flow events in the Barwon–Darling River at Wilcannia over the last 130 years, with and without current development



Panel approach and recommendations

Thus, the Panel's approach is not simply **"more water in the river"**. It is about restoring **different components of the flow regime at appropriate frequencies and magnitudes**.

The Panel therefore examined water sharing plan rules governing pumping of inflows to rivers below dams and floodplain harvesting. They concluded that rules need to be designed to protect environmental and human needs. It also recognised that the consequences extend beyond the immediate floodplain: changes to lateral connectivity in tributaries ultimately affect longitudinal connectivity all the way to the Murray.

The most important protection measures recommended by the Connectivity Panel, are to change water-sharing rules so that environmental connectivity needs become a constraint on extraction. The Panel recommended targets and various protection measures designed to provide, as far as possible:

Baseflow almost all of the time

A small fresh every year

A larger fresh at least once every 2 years

The panel did not make recommendations regarding bankfull or overland flows due to their focus on longitudinal not lateral connectivity.

The recommendation for large freshes is far from full restoration of height, frequency or duration. It is to ensure that rules restricting floodplain harvesting and "supplementary" access protect a flow event that reaches the bottom of the large fresh range for 10-15 days – this may reach billabongs along tributary rivers but only a few along the Barwon-Darling/Baaka[i].

More billabongs could be reached if higher flows are protected, or if water purchased from irrigators to be environmental water is used when a large fresh is only partially protected by this rule, topping it up.

The volumes purchased and held as environmental water are not on their own sufficient to reach many billabongs. They could if these minimal restrictions on floodplain harvesting and supplementary access become rules in water sharing plans as a base to build on.

The Panel recognised that requirements cannot always be achieved during severe drought but drew attention to the long-lasting effects of high flows in wetter periods which soak into the riverbanks: it is likely that at least partially restoring large freshes in non-dry periods would help to maintain base flows for longer into droughts. Flow protection should no longer be delayed until downstream systems are already critically degraded.

Connectivity Expert Panel Final Report — NSW Government

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Billabongs

Speaking up for Billabongs

We need everyone to speak up and show support for our iconic and forgotten billabongs.

Tell the NSW Environment Minister and Water Minister why you want billabongs to get their fair share of river flows. They must be remembered in water management decisions such as new rules in water sharing plans.

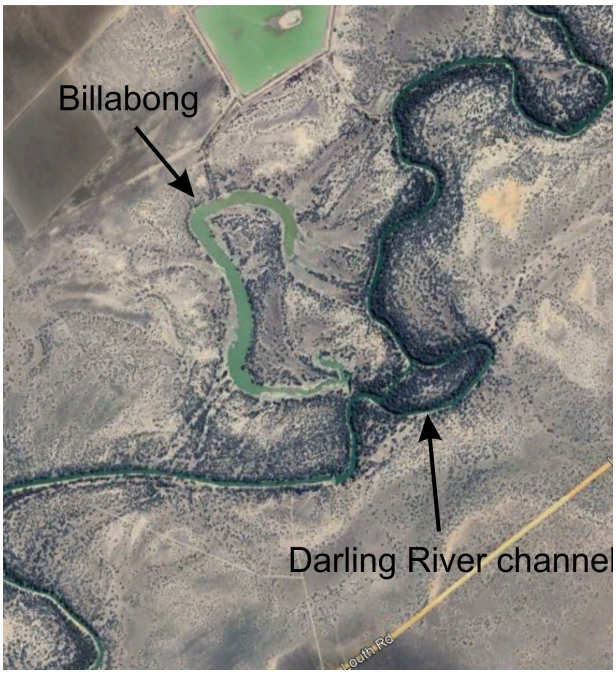
Minister for Environment: The Hon. Penny Sharpe MLC. https://www.nsw.gov.au/nsw-government/ministers/minister-environment-heritage

Minister for Water: The Hon. Rose Jackson MLC. https://www.nsw.gov.au/nsw-government/ministers/minister-for-water-housing-homelessness-mental-health-youth-and-north-coast

The Connectivity Expert Panel has recognised that large freshes of water are needed in the Barwon-Darling at least once every two years to maintain river health. These higher river flows will connect with some of the lower lying billabongs through low points in the riverbank. Most need larger freshes than the panel recommended be protected. If enough of the environmental water bought back from irrigators can be put on top, more billabongs can be connected.

The first step is to lobby for recommended large fresh targets in the Barwon-Darling to be met by new rules in water sharing plans in the NSW northern basin. These are the Border Rivers, Gwydir, Namoi and Macquarie/Wambuul rivers. These additional flows also need to be protected from extraction in the Barwon-Darling water sharing plan

It is very important that the Connectivity Expert Panel large fresh recommendation is implemented to give billabongs a fighting chance:



Panel Recommendation - Protect large freshes

"Regulated water sharing plans should include restrictions on supplementary and floodplain harvesting, and B and C class licences in the Barwon-Darling to achieve periodic large fresh flows

* *Mungindi (416001) 3,000 ML/d*
* *Collarenebri (422003): 4,200 ML/d*
* *Walgett (419091): 6,500 ML/d*
* *Bourke (425003): 15,000 ML/d*
* *Wilcannia (425008): 14,000 ML/d*

15 days minimum at least once every 2 years.

Anytime, but ideally July to September.

15 days must be targeted. However, if an event is targeted with restrictions and the large fresh flow is only achieved for 10 days or more, it will be considered as met for that period.

Starting in July restrictions begin if a large fresh has not been achieved in the previous 24 months and the operator forecasts that flows are likely to achieve at least 85% of the large fresh targets."