NSW GOVERNMENT | Office of Environment & Heritage

A profile of the Darling River system

Life in the landscape

The Darling River is an integral part of the Murray–Darling Basin system. It carries life-giving water across the landscape, sustaining towns, farms and a unique array of native plants and animals.

It is part of a connected system. Events that occur in the Darling River can have a significant impact on the health of the Murray River and its tributaries.

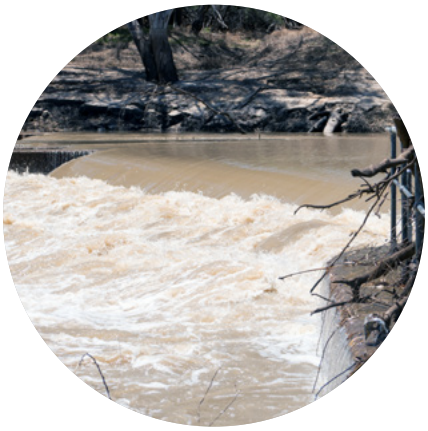
Native fish populations, food webs and water quality across the southern basin are all influenced by the movement of water through the Darling River.

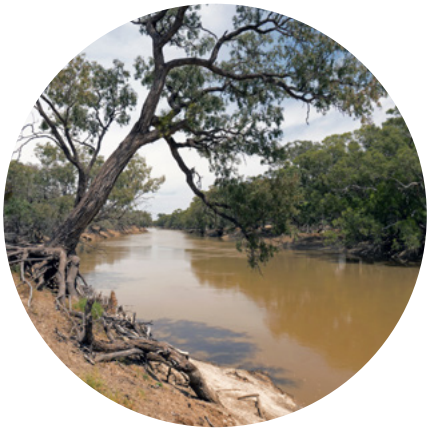
A long and winding river

The Darling River begins between Brewarrina and Bourke, where the Barwon and Culgoa rivers merge. It meanders south-south-west until it meets the Murray River at Wentworth. It is fed by the rivers and floodplains of the northern Murray–Darling Basin along with the many tributaries along its path.

From its official source to its meeting place with the Murray, the Darling River is 1472 kilometres long.

Most of the water which flows through the Darling River originates in southern Queensland and northern NSW. Rainfall over the floodplains in this region is captured in rivers which merge one by one to form the Darling River. The Darling then continues its journey through semi-arid country toward Menindee. There, a series of floodplain lakes, known as the Menindee Lakes, capture high flows which in turn feed into the Darling River and, during higher flows, the Darling Anabranch.





The Darling River has a rich Aboriginal cultural heritage dating back tens of thousands of years. The region is occupied by a number of Aboriginal nations and is commonly known as 'Barka' by the Barkindji people.

The Menindee Lakes

The Menindee Lakes consist of four main lakes connected to the Darling River and to each other via a series of channels.

The lakes have been adjusted over time to service industry needs with increased storage capacity for downstream users (including Victoria, NSW and SA) and to supply drinking water to the township of Broken Hill.

Lake Cawndilla – the southernmost lake within the Menindee system – connects to the Darling Anabranch via Redbank Creek which feeds Packers Crossing. This is the delivery point for environmental water into the Darling Anabranch.

The upper Menindee Lakes connect with the Lower Darling River via Weir 32. Flows into this section of the river support a range of agricultural and environmental assets.

When flows exceed 12,000 megalitres per day at Weir 32, water can enter the Darling Anabranch from the Darling River via the Darling Anabranch offtake.

Sharing the river resource

The waters of the Darling River are shared for different purposes under regulations in Queensland and NSW and across the partner states of the Murray–Darling Basin. Although the river flow is intermittent, it is important the sharing of this water is sustainable to protect Aboriginal values and maintain a healthy river system, as well as providing water for towns, industry, agriculture and floodplain pastoral enterprises.

Native fish of the Darling River

The Barwon–Darling is a renowned 'hot-spot' for native fish recruitment. The Menindee Lakes system provides important habitat for these young fish to grow. The Lower Darling and Darling Anabranch transport golden perch from Menindee Lakes and Lake Cawndilla to the Murray River where they are able to colonise sites hundreds to thousands of kilometres away.

Reduced flows through the Darling River system mean fewer opportunities for native fish to breed, feed and disperse. Reduced frequency of flows from Lake Cawndilla into the Darling Anabranch will likely mean fewer opportunities for native fish to move into and repopulate the southern connected rivers.

This is where the Office of Environment and Heritage (OEH) plays an important role by providing flows that help fill some of the gap left by reduced flows in the system. Natural flows in the Barwon–Darling are important to allow fish to recruit (breed), survive and disperse.

River pulses provide breeding cues for golden perch while flows of particular heights provide nesting habitat for Murray cod. Environmental water connects isolated pools where native fish seek refuge during periods of low flow. The movement of water through the river channel and across in-stream benches (raised sections of the river bed) also energises the food web providing food for fish to eat as they grow.

Cover photo: the Darling River meets the Murray, E Wilson/OEH. Above left to right: Bourke Weir, T Cooke; Darling River, T Cooke; Moon over Darling Anabranch, P Brown.

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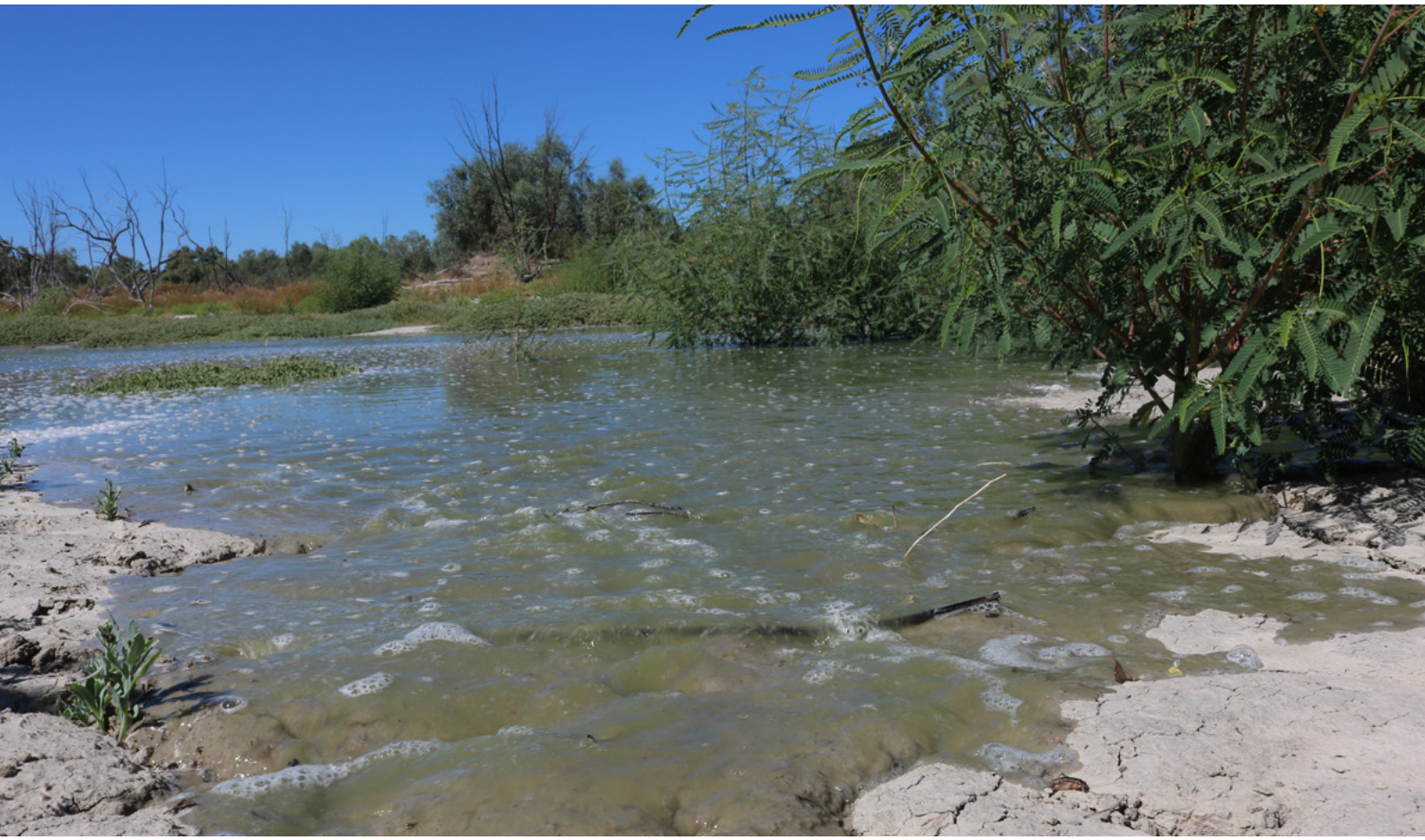
Native fish of the Darling River

Managing water for fish and connectivity



Flows for golden perch

The Darling River is home to a significant population of golden perch.

Research has shown that golden perch that are spawned in the Darling River contribute enormously to populations in the mid-Murray, including the Edward–Wakool and Goulburn rivers, right through to the lower lakes in South Australia and the Darling River itself.

Flow pulses in the river trigger golden perch movement and breeding. The resulting eggs hatch as they drift downstream. Many small fish from the upper reaches of the Darling River and its northern tributaries end up in the waters of Menindee Lakes. There they can feed and grow until the lakes reconnect with the river and the young fish are able to disperse throughout the river system.

Monitoring during the 2010–11 floods documented this mass dispersal (movement) to other rivers. The dispersal of young fish happened again when environmental flows reconnected the Menindee Lakes to the Lower Darling and Murray rivers in 2017.

Opportunities for golden perch to breed and disperse have been reduced by river regulation and changes to flow patterns. Historically, natural flows and flood events would have provided regular inflows into the Menindee Lakes. The lakes would sometimes retain this water for several years, allowing for subsequent flows to reconnect the lakes with the river.

Today, it is only during periods of high flow that water from the Darling River fills the four main lakes that make up the Menindee Lakes system.

Lake Cawndilla – part of the Menindee Lakes system – now provides one of the only viable release points for golden perch to enter the Darling Anabranch and the rivers of the southern basin.

To support this vital fish population and its connection to the rest of the river system, the Office of Environment and Heritage (OEH) is managing environmental flows that allow native fish to move from the Menindee Lakes into the Murray River via the lower Darling and Darling Anabranch.

Supporting Murray cod

Murray cod have different flow requirements.

While golden perch need pulses of water to trigger spawning, endangered Murray cod spawn in response to water temperature, and need access to nesting habitat that is more readily available when higher flows are moving through the river.

The Darling River, downstream of Menindee, supports a robust population of the iconic Murray cod. The population includes a mixture of ages which indicates regular breeding success in the past. However, a number of cease-to-flow events in the past 10 years has impacted on the breeding success of this native fish population.

Unlike golden perch which are known to travel long distances in a lifetime, Murray cod can complete their entire lifecycle within a relatively small stretch of the river, sometimes spanning just a few kilometres.

Murray cod nest among vegetation on raised sections of the river bed known as in-stream benches. There, larval fish find some protection from predators and other threats. During periods of low or no flow, these in-stream benches are exposed and essential breeding habitat cannot be accessed by the fish.

As well as spawning cues and provision of habitat, water is essential to kickstart the aquatic food web. The movement of water through the river channel, flood runners and floodplains releases vital nutrients and carbon which can be picked up by water plants, plankton, insects and ultimately native fish of all sizes. Ensuring a steady supply of food for the lifetime of the fish is a critical part of flow management.

Environmental water plays a vital role in ensuring native fish can complete their lifecycles. However, natural flows are the key as they provide the necessary volumes of water required to trigger fish breeding, maintain habitat, fill the Menindee Lakes and connect them to the Murray River.

Cover photo: water arrives on the Darling Anabranch, P Brown/OEH.
Above left to right: Golden perch, G Schmida; Murray cod, G Schmida; Water moves through the Darling Anabranch, P Brown.

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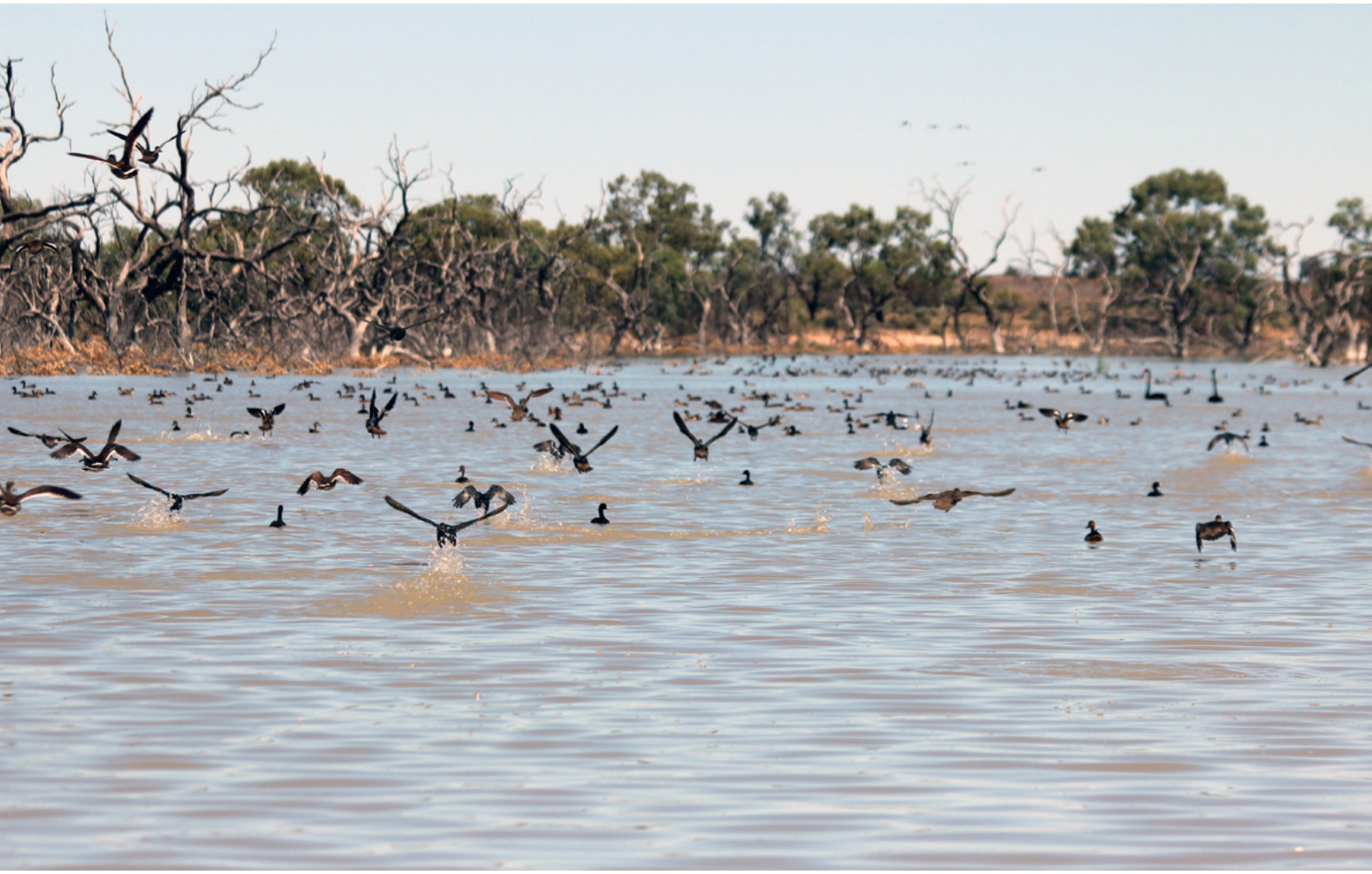
Protecting the future of the Darling River

Water for river health



Healthy rivers are the lifeblood of inland NSW. They support social, economic and environmental outcomes. In regulated rivers, the future of these important ecosystems relies on the responsible management of water.

In NSW, the Office of Environment and Heritage (OEH) manages a share of the available water to maintain and support the health of rivers and wetlands. OEH works in partnership with communities, landholders, researchers, non-government organisations and allied government departments.

The iconic Darling River is part of a connected system. Events that occur in the Darling River can have a significant impact on the southern Murray–Darling Basin.

By managing the delivery of water into the Darling River and its anabranch, OEH is able to target outcomes like fish breeding and movement, water quality, plant health and building food webs that support native animals.

Water managers recognise the critical role of the Darling River in providing outcomes for the whole of the southern connected basin including the

Murray River, Edward–Wakool, Murrumbidgee and Victorian tributaries such as the Goulburn River. Work is ongoing to protect and enhance the plants, animals and processes that are essential to the future of the river system.

Water for the Darling Anabranch

OEH is currently managing the release of 100 gigalitres of environmental water from Lake Cawndilla into the Darling Anabranch.

The aim of this watering event is to provide a flushing flow for the anabranch that will provide passage for native fish (in particular golden perch), support other native plants and animals and improve water quality.

Lake Cawndilla – the southernmost lake within the Menindee system – is the only available release point for juvenile golden perch to enter the Darling Anabranch and the rivers of the southern connected basin.

Golden perch numbers within Lake Cawndilla and the other three Menindee Lakes have surged as a result of natural flooding in the Darling in 2016. Environmental water is now providing a connection between their nursery habitat in Lake Cawndilla and the rivers of the southern connected basin.

Without this link, these golden perch would be stranded in Lake Cawndilla, vulnerable to the lake drying out. They would have no opportunity to escape unless another large natural flow occurred.

Flows for the lower Darling River

The lower Darling River is home to a significant population of endangered Murray cod. While the population of cod is known to include a range of ages which indicates regular past breeding, an increase in the number of times the lower Darling River has ceased to flow has greatly reduced opportunities for breeding.

In 2016, Murray cod were stranded in a series of small, shallow, saline ponds along the lower Darling River. OEH managed an environmental water delivery to connect the pools. Without this environmental flow it is unlikely these fish would have survived beyond six months.

After a natural flow event in late 2016, plans were approved for a further release of environmental water to support Murray cod breeding. This water delivery provided an opportunity for fish to complete their breeding cycle and also boost the food web in order to sustain the population. Monitoring showed a significant positive breeding response, with possibly the greatest number of juvenile Murray cod recorded in over 20 years.

The flow also contributed to improving water quality and reduced salt readings.

Cover photo: the Darling Anabranch, P Brown.
Above left to right: Murray cod, G Schmida; a researcher on the Darling Anabranch, P Brown; water arrives, P Brown.

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