Australian Government
Commonwealth Environmental Water Office

NSW GOVERNMENT

Northern Fish Flow Update 1

Parts of the Barwon River in the northern Murray-Darling Basin have not flowed for over 200 days, drying back to waterholes with poor water quality, putting our native fish at risk. From April to June 2019 the Northern Fish Flow will deliver water for the environment to this river system to help our native fish survive the drought.

NORTHERN FISH FLOW – OBJECTIVES

Help native fish and animals survive the drought.

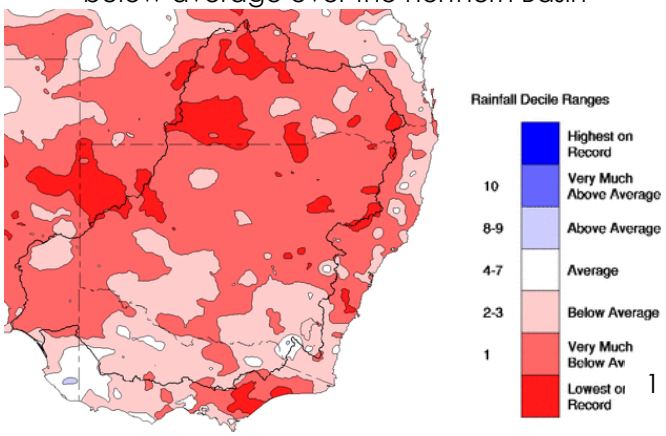
Improve water quality, connect the rivers, and improve habitat for native fish and animals.

WHY DELIVER WATER NOW?

Very dry conditions have persisted across the northern Basin over the last two years, with low rainfall and record high temperatures.

Water for the environment connected the Macintyre, Mehi rivers and the Carole-Gil Gil Creek systems with the Barwon-Darling River in autumn 2018 (the Northern Connectivity Event). Since then flows have been small and isolated in the Barwon River with some waterholes at their lowest level in 50 years.

Rainfall 1 April 2017 – 30 March 2019 was very much below average over the northern Basin



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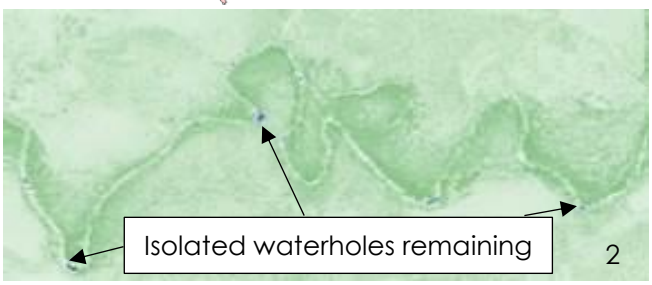

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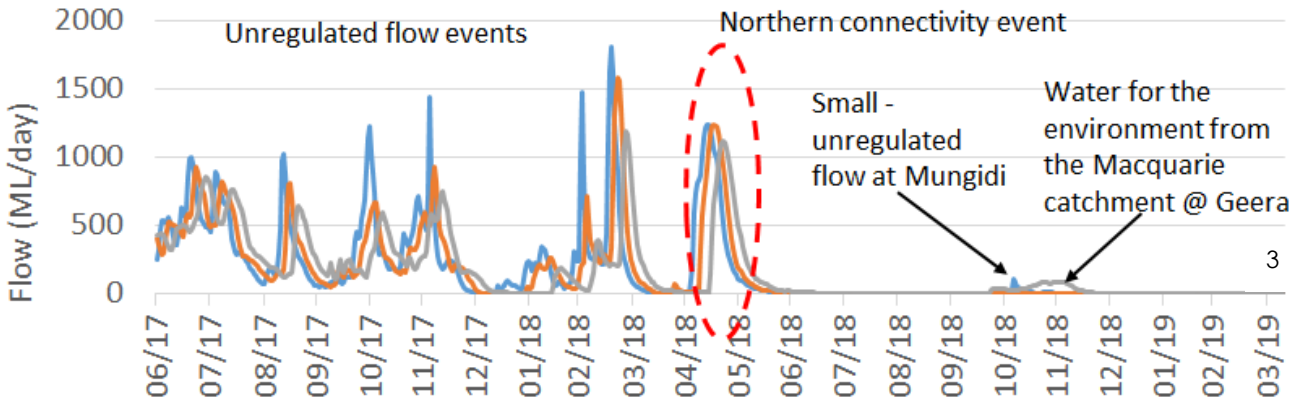
Waterholes drying back in the Barwon River downstream of Walgett as at April 2019

The hydrograph below shows the flows along the Barwon River at Collarenebri (blue), Walgett (orange) and Geera (grey) since June 2017, and confirm how dry it has been 'out west'. There were some unregulated flows in the Barwon and the northern rivers up to April 2018. Whilst the Barwon does cease-to-flow from time to time, this event is unusually long, exceeding 200 days at places including Walgett.



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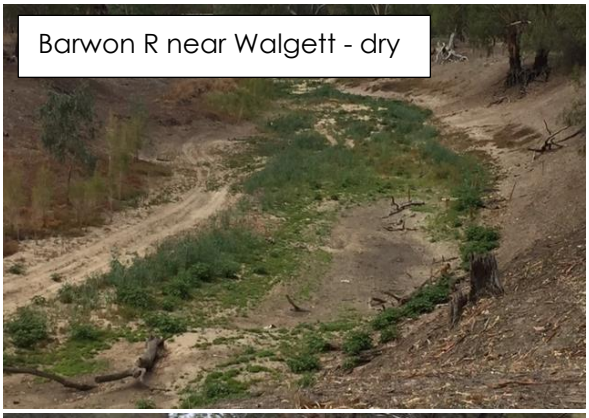
In May and June 2018, the Northern Connectivity Event flowed along the Barwon-Darling to Menindee Lakes to support native fish and animals. Since June 2018, there has only been a small unregulated flow at Collarenebri, and a flow of water for the environment from the Macquarie River into the Barwon River at Geera. At Walgett, the Barwon River has not flowed since June 2018 and the dry riverbed is exposed over long distances. The northern rivers, including the downstream sections of the Mehi (in the Gwydir catchment) and the Barwon are now in poor condition. The Macintyre is less stressed due to several small flows and irrigation deliveries over the summer season.


Mehi R at Bronte


Barwon R near Walgett - dry


Barwon R at Devil's Pool – drying up


Barwon R near Walgett – drying up

4

When rivers stop flowing they become a series of disconnected pools. These pools provide important refuge for native fish and animals such as turtles, helping them survive dry times. As pools dry back habitat quality can drop putting native fish at risk of disease and death.

RECENT MONITORING OF NATIVE FISH

Monitoring of native fish shows parts of the northern Basin, including the Barwon and Macintyre rivers, are a stronghold for native fish. Five threatened fish species live there.

Fish in the now isolated waterholes in the Barwon are showing signs of stress due to reduced food sources, over-crowding, and poor water quality. Some fish recently sampled along the Barwon have red spot disease (left photo), parasites (bottom left), and are underweight (below), which are signs of stress.

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In March 2019 the deaths of about 200 fish on the Barwon River near Calmundi Weir confirmed the water quality in some pools has become very poor.

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Importantly, there are some healthy fish in parts of the northern rivers despite the drought, including in the Barwon River at Brewarrina, and upstream in the Gwydir, Mehi, Macintyre and Dumaresq rivers. Recent photos of Murray cod from the Gwydir River and olive perchlet from the Dumaresq River are below. Connection can help these healthy populations replenish others.

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The Northern Fish Flow is carefully timed to reduce the risk of fish kills due to low oxygen. Mixing of deoxygenated water in the bottom of waterholes in the heat of summer and early autumn can do more harm than good for native fish. By late autumn this risk reduces, and the chance of natural flows in the northern Basin from summer-autumn rainfall decreases. It is now time to act to help native fish and animals survive this drought.

WHERE WILL THE NORTHERN FISH FLOW GO?

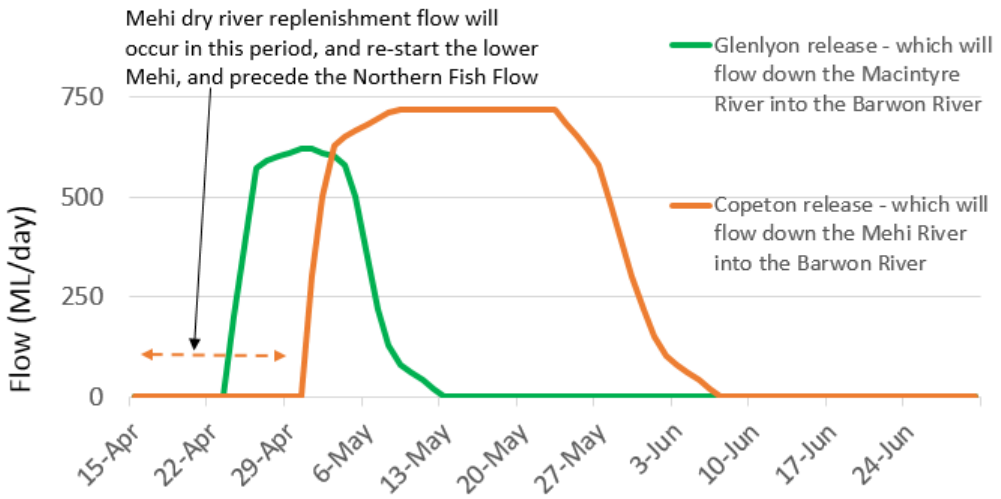
The total volume of water for the environment to be delivered by the Northern Fish Flow will be between 27 and 36 GL. Within this volumetric range, the flow will be adjusted adaptively based on the progress of the flow so as to reach at least the Macquarie-Barwon junction. NSW and the Commonwealth are each contributing water. This water was allocated to environmental water holders during the last wet period in the north in 2016 and has been stored in dams since. Over 1,000 km of river habitat will benefit from the Northern Fish Flow along the Dumaresq, Macintyre, Gwydir, Mehi and Barwon rivers. The exact distance the water will reach down the Barwon is hard to forecast due to the extremely dry conditions.

While we would like the water to reach further down the Barwon-Darling, this is not possible as only a small amount of water for the environment remains in storage and some carryover is needed to support fish in the Border Rivers and Gwydir catchments next year. The water is not expected to flow as far as the Northern Connectivity Event due to the dry conditions. However, having more water in the river in upstream reaches will mean future natural flows may make it further downstream. For example, the small flows into the Barwon from the Namoi and Macquarie/Castlereagh systems following recent rain will help the Northern Fish Flow make its way further along the system.

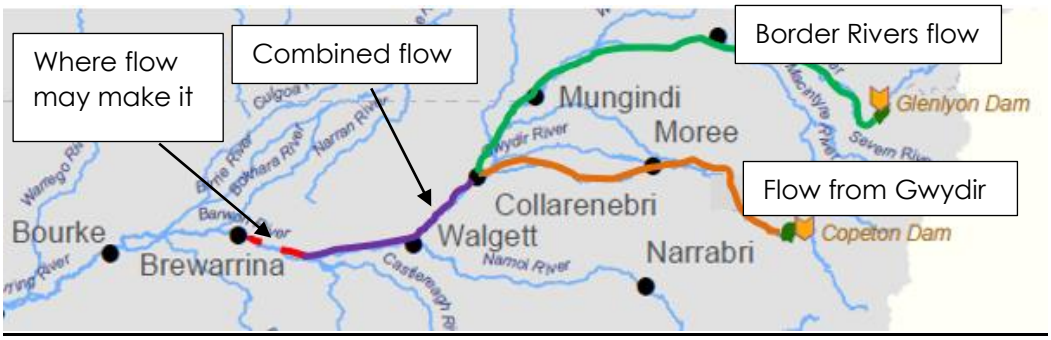
The flow from Copeton Dam to the Mehi River will follow an important river maintenance flow of 3.7 GL currently replenishing river pools along the Mehi River. The flow in the Border Rivers will follow a small unregulated flow of around 1.2 GL in the Barwon at Mungindi, which recently wet up the system. Releases from the two dams will be timed so the water arrives at Collarenebri on the Barwon River at around the same time (mid-May).

Indicative release patterns from the two dams for the Northern Fish Flow are shown on the next page. As NSW and the Commonwealth have more water in the Gwydir catchment than in the Border Rivers, the release from Copeton Dam will have a higher peak and longer duration than from Glenlyon Dam. The flows have been designed to help fish move around the Mehi and Macintyre, and to gently recede. The flow from the Border Rivers has a greater distance to travel to Collarenebri, so the releases will commence a week earlier.

Indicative release patterns, assuming 7.4 GL released from Glenlyon Dam, and 20 GL released from Copeton Dam.



Flow path. The minimum endpoint of the flow is the Macquarie-Barwon junction.



Copeton and Glenlyon storages currently hold around 170 GL and 30 GL of water respectively. Given the extreme dry conditions, releases from storage may be adjusted to respond to the actual flows achieved. The flow may also be adjusted to carefully manage and reduce the risk of lowering dissolved oxygen in the river downstream. WaterNSW will provide updated communication on the progress of the flows along the systems. Additionally, further updates like this will be shared during the Northern Fish Flow.

Arrangements to protect the flow are in place for both NSW and Queensland. Compliance officers from NSW Natural Resources Access Regulator and the Murray-Darling Basin Authority will oversee the flow. Details about the protection of water in NSW can be found at: https://www.waternsw.com.au/about/newsroom/2019/temporary-pump-restriction-for-barwon-darling-enviro-release . Some stock and domestic licence holders along the system can contact WaterNSW about ordering water that can be delivered with this flow.

WHAT MONITORING WILL TAKE PLACE?

Flow: The flow will be monitored using the gauge network and satellite tracking. Flow will be monitored by river operators, compliance officers and environmental water managers.

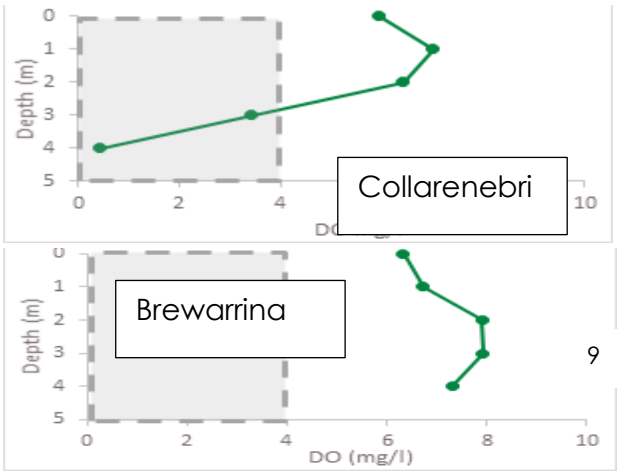
Water quality: Monitoring of refuge pools along the Barwon was undertaken in March 2019 by Eco Logical Australia. Monitoring undertaken by Eco Logical Australia, NSW DoI - Water and WaterNSW will provide water quality information during the flow.

Recently, at Collarenebri weir pool, dissolved oxygen has been measured below 4 mg/L at the deepest points. Fish become stressed at dissolved oxygen concentrations less than 4 mg/L. The fish would avoid this deep water and survive in the top layer. Less than 10 per

cent of the weir pool was found to have low dissolved oxygen – adding more oxygenated water will help fish and other animals survive and provide healthier habitat.

Instaling a dissolved oxygen logger - Dr. Mark Southwell (Eco Logical Australia)

Dissolved oxygen varies with depth in the Collarenebri and Brewarrina weir pools.



Fish: NSW Department of Primary Industries – Fisheries is undertaking long-term monitoring of fish populations in the northern rivers as part of the Basin Plan Environmental Outcomes Monitoring.

Fish movement: As part of an existing project, Department of Industries – Water and DPI – Fisheries installed equipment (an acoustic array) to monitor movement of tagged fish in the Mehi, Macintyre River and Barwon Rivers. This array may record the movement of tagged golden perch during the flow.

WORKING TOGETHER TO KEEP OUR RIVERS HEALTHY

The Northern Fish Flow has the support of the community based Gwydir Environmental Water Advisory Group, who recognise the need to balance current and future environmental needs within the Gwydir catchment with the immediate needs of native fish and animals in northern rivers including Barwon River. In the coming months, the Northern Fish Flow will be discussed in more detail with individuals and organisations from local communities including councils, schools, irrigation groups, landholders, environmental groups, and Aboriginal groups, amongst others. Further updates will be provided as the flow moves through the system and published here: http://www.environment.gov.au/water/cewo/catchment/Northern-fish-flow-2019

As well as the vital environmental benefits provided from this event, this flow will help support important Aboriginal environmental, cultural and spiritual values in the river systems. The flows will also provide social benefits such as contributing to town water and basic stock and domestic water supplies, and provide recreation and tourism benefits along the river systems. Additionally, water will be held back in storages for essential supplies.

The Commonwealth Environmental Water Office is partnering with the NSW Office of Environment and Heritage to deliver the Northern Fish Flow. Other agencies that will contribute are the NSW DPI – Fisheries, DoI – Water, WaterNSW, the NSW Natural Resources Access Regulator, the Queensland Department of Natural Resources and Environment, and the Murray-Darling Basin Authority. This is an example of government agencies working together to deliver outcomes under the Basin Plan.

CONTACTS

CEWO Local Engagement Officer: Jason Wilson

0418 210 389

jason.wilson@environment.gov.au

NSW OEH Senior Wetlands & Rivers Conservation Officer: Daryl Albertson

0407 071 985

daryl.albertson@environment.nsw.gov.au

NSW OEH website

http://www.environment.nsw.gov.au/topics/water/water-for-the-environment/about-water-for-the-environment

CEWO website and email

https://www.environment.gov.au/water/cewo

ewater@environment.gov.au

Image credits: 1 – Bureau of Meteorology; 2 – Sentinel 2 satellite images, which have a resolution of 10m2 and cover the whole Murray-Darling Basin every few days; 3, 8 – Commonwealth Environmental Water Office; 5, 6, 7 – NSW DPI Fisheries; 9 – Eco Logical Australia