

Active Management Case Study

To demonstrate the concept of active management, we conducted a joint study with the Murray–Darling Basin Authority to analyse the flows in the March and April–June 2018 events in the Barwon-Darling River, to determine the effect of having active management in place.

The New South Wales Government is committed to improving the way we manage environmental water in the NSW northern Murray-Darling Basin to maximise environmental outcomes that improve the health of the Basin.

We propose to put in place an increased level of management in the Barwon-Darling Unregulated River Water Source. Known as active management, this will allow environmental water used in-stream for environmental purposes, referred to as active environmental water, to be protected from extraction.

Active management is a new operational tool that ensures that water released for the environment will remain in-stream to be used for its intended environmental purpose.

Background

In January 2018, over 1,000 kilometres of the Barwon-Darling River downstream of Brewarrina ceased to flow. Water quality deteriorated in stagnant waterholes and native fish and other aquatic life experienced significant stress.

Rainfall in the upper parts of the Moonie catchment in February 2018 created a flow through this river and into the Barwon-Darling in March. This rainfall-sourced flow was protected from extraction for social purposes and it provided some relief for river-dependent communities and the environment at the time. However it was insufficient to fully replenish drought refuge waterholes or substantially improve connectivity between waterholes.

In response, the Commonwealth Environmental Water Office partnered with the former NSW Office of Heritage and Environment to release up to approximately 32 gigalitres of environmental water from April – June 2018. Releases from Copeton Dam on the Gwydir River, and Glenlyon Dam on Pike Creek in the Border Rivers, built on the earlier natural inflows into the Barwon-Darling and connected over 2,000 km of waterways in the northern Basin. Allowing this held environmental water to flow through the Barwon-Darling to its natural extent benefited the environment and communities along the river.

Temporary water restrictions protected water from extraction

Both the March rainfall sourced event and the April–June Northern Connectivity Event were protected from extraction using temporary water restrictions. Access was permitted only for basic landholder rights, and high priority licences such as domestic and stock, local water utility and town water supply.

Temporary water restrictions are a suitable interim measure to manage held environmental water flowing in-stream but don't offer long term certainty for licence holders, either consumptive and environmental, to manage their water effectively. Also, they lack the necessary flexibility to manage events with mixed sources of flow.

Active Management

We propose to protect environmental water used in-stream in the Barwon-Darling, lower Gwydir and lower Macquarie through active management rather than by relying on temporary water restrictions.

Active management will ensure that held environment can remain in-stream as it passes through an unregulated water source.

Case studies

To demonstrate the concept of active management, we conducted a joint study with the Murray–Darling Basin Authority to analyse the flows in the March and April–June 2018 events, and determine the effect of having active management in place.

We analysed the actual flows in the April – June 2018 Northern Connectivity Event and estimated the volume of flow that would normally have been subject to licenced take when the commence-to-pump thresholds in the water sharing plan were met.

We also analysed the March 2018 flow event, and estimated what the event would have looked like without the temporary water restrictions, and with active management in place. This shows the potential benefits that we can expect from using held environmental water licences in the Barwon-Darling River.

In both cases we assumed that water is taken if permitted to be taken and extractions would not exceed proposed total daily extraction limits. This approach may have overstated the overall take,, however, not be the case as licence holders do not always take water when permitted to take water.

The Northern Connectivity Event

Figure 1 shows the estimated flows for the Northern Connectivity Event if the held environmental water was not protected from extraction as it flowed through the unregulated river.

As the flow was large enough to trigger some of the unregulated river licence access conditions, it could have been legally taken under normal water sharing plan rules. In this scenario, if extraction had occurred in accordance with the access rules in the water sharing plan, flow at Bourke (blue line) and Wilcannia (red line) would have decreased. Flow at Wilcannia would have been a fraction of the actual flow achieved.

Social and environmental outcomes would have been reduced if licensees were permitted to take water during this event, and if they extracted all the water they were permitted to.

This analysis shows that social and environmental outcomes can be enhanced by using active management to protect active environmental water used in-stream in unregulated rivers.

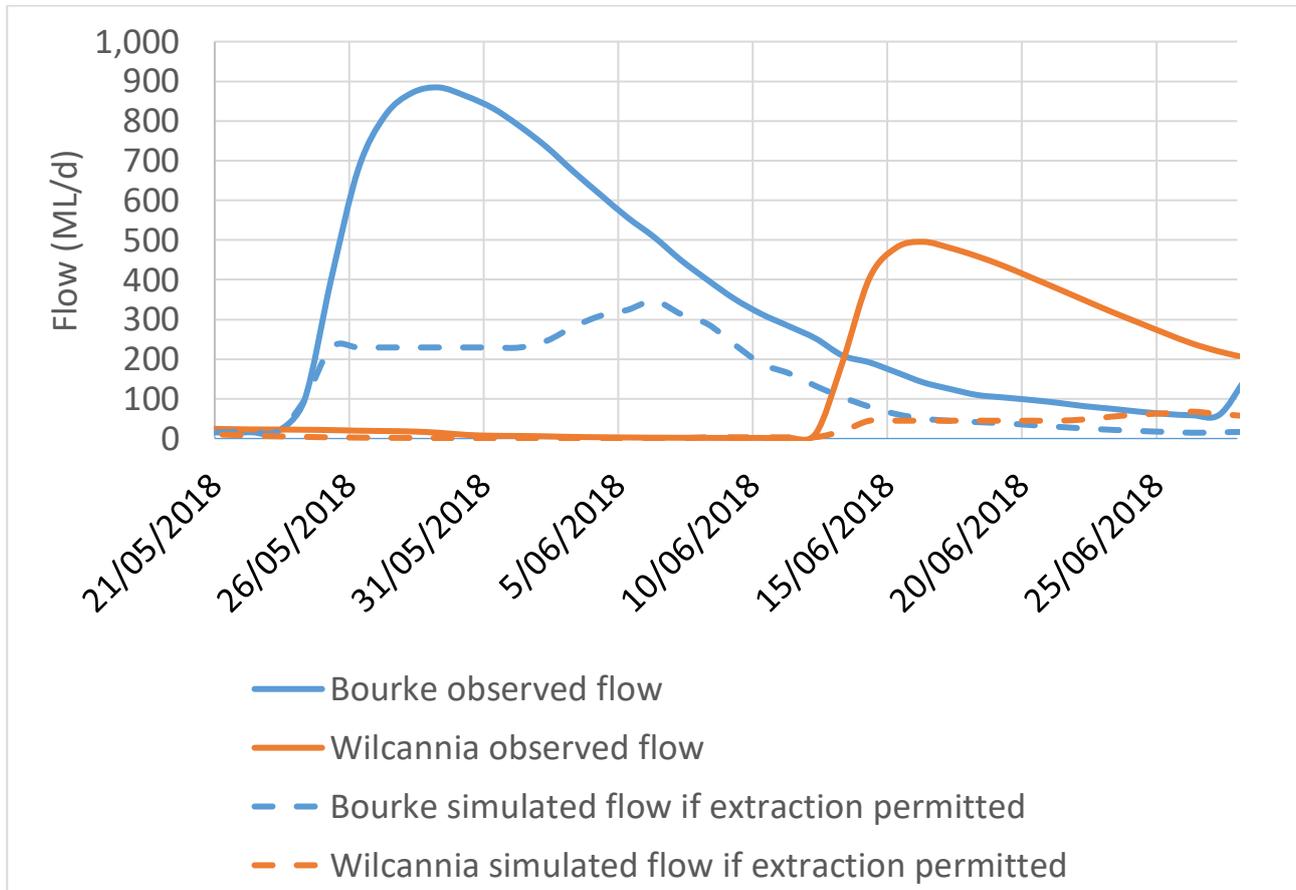


Figure 1: Northern Connectivity Event - observed flow (solid lines) and simulated flow without temporary water restrictions (dashed lines).

Allowing unregulated held environmental water to be used in-stream

Figure 2 shows how an event like that which occurred in March 2019 would change if it had been managed under the proposed active management arrangements.

This figure shows flows in Zone 5 – Collarenebri to Upstream Walgett Weir Pool Management Zone. There is 12,983 ML of B Class and 6,963 ML of C Class unregulated river access licences held by environmental water holders in management zones upstream of Zone 5.

The blue shading illustrates how the March 2018 event might have appeared if the temporary water restriction was not put in place, and licence holders were permitted to access to flows.

If active management was applied, some of the water available to unregulated river access licences would have been available to licences held by the Commonwealth Environmental Water Holder to use in-stream. The green shading shows the potential effect of using the unregulated held environmental water licences from upstream zones in-stream, if active management were place.

Active management ensures that the environmental entitlements’ share of the available water remains in-stream increasing the flows through each zone until it attenuates.

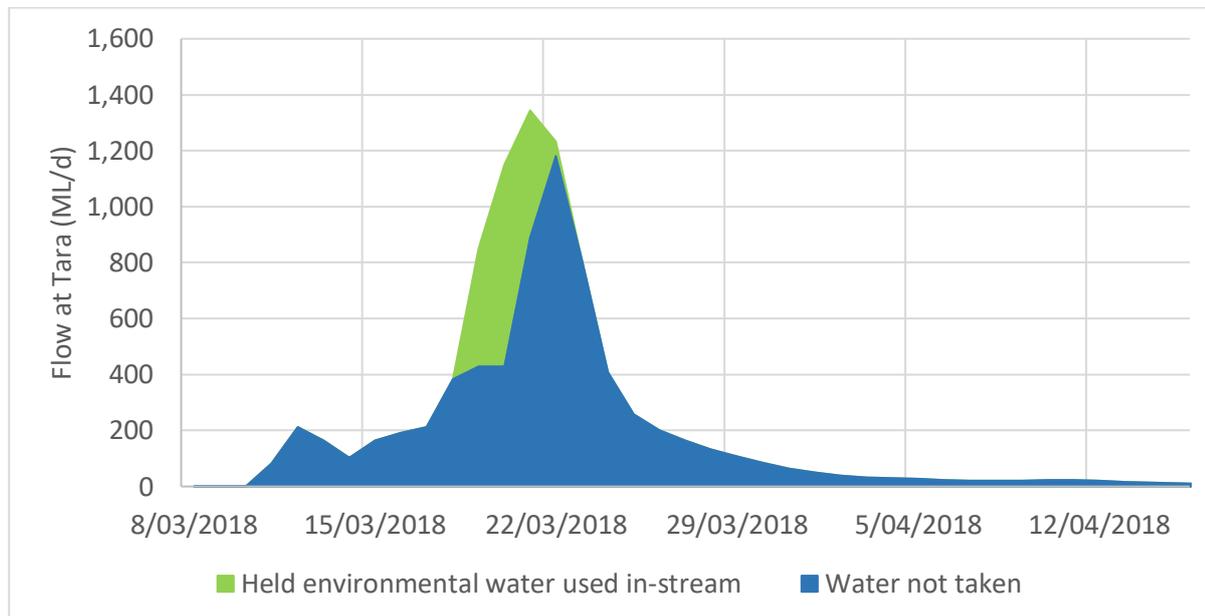


Figure 2: Modelled analysis of flow in Zone 5 Barwon—Darling River during March 2018

When actively managing an unregulated water source, we will need to predict (or forecast) water losses in order to calculate the volume of environmental water managed in-stream, and the volume of water available for unregulated river access licences.

These case studies have assumed perfect foresight in relation to losses. Of course, we won't have this foresight when managing future events. It will be important to manage uncertainty in a way that ensures the intended environmental, social and economic outcomes of active management are achieved in an equitable way. The Active Management Procedures Manual for the Barwon—Darling River will lay out our approach to managing losses.

Have your say

We seek your comments on:

- The *Active Management in Unregulated Rivers – Draft policy for public consultation* available from <https://www.industry.nsw.gov.au/barwon-darling-wrp>
- *Water Sharing Plan for the Barwon-Darling Unregulated River Water Source 2012 (Proposed Amendments 2020)* available from <https://www.industry.nsw.gov.au/barwon-darling-wrp>
- *Proposed amendments to the Macquarie Bogan unregulated water sharing plan for active management* available from <https://www.industry.nsw.gov.au/water-macquarie-bogan>
- *Proposed amendments to the Gwydir unregulated water sharing plan for active management* available from <https://www.industry.nsw.gov.au/water-gwydir>

Make a submission

To make a submission, refer to the links above. All submissions will be considered when finalising the plan. **Submissions close at 5 pm on Tuesday 29 October 2019.**

More information

If you want to be kept informed about all of the departments upcoming engagement activities please visit our [website](#) or join our [newsletter](#).

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