



Submission:

NSW Review of Management of the northern Basin 'First Flush Event'.

Context

The Commonwealth Environmental Water Holder (CEWH) commends NSW for undertaking this review of the 2020 first flush event. The CEWH appreciates the opportunity to provide a submission to this important review.

First flush events are vital for riverside communities, First Nations communities, and for the health of the rivers in the Murray-Darling Basin. If climate change results in the Basin experiencing longer dry spells and more extreme rainfall, then management of first flush events will become increasingly important.

The recommendations in this submission are made in the context of the CEWH's understanding of the NSW *Water Management Act 2000*, particularly with respect to the priority for allocation of water. In that Act, the two highest priorities during a severe water shortage are critical human and environmental water needs.

The CEWH acknowledges that, in the 2020 flow event, NSW made a significant effort to provide for connectivity along northern tributaries and into the Barwon-Darling River. The first flush enabled water to flow over thousands of kilometres of river channel, bringing increased hope to many in the community following the severe drought. Connectivity of flow between the Darling River and the Murray River was achieved. In addition to the social benefits from this first flush, significant environmental benefits have been achieved. For example, golden perch spawned, which is important for the recovery of this ecologically and culturally significant species.

The CEWH offers ten recommendations regarding the management of first flush events to the independent reviewers and NSW. In summary, the recommendations are focussed on the importance of advance preparation for first flush flow events. Understanding and addressing any barriers to a swift response is a priority. Given the criticality of these first flush flows to the health of Basin rivers and internationally significant wetlands, advance planning is critical to optimising benefits of connectivity.

Recommendations

1. **During an extended cease-to-flow event, that NSW publishes current critical human and environmental needs and updates them as required.**

During a severe water shortage, critical human and environmental water needs are the highest priorities under the NSW *Water Management Act 2000*. As a water shortage develops, we recommend that NSW publishes and periodically updates information on critical human and environmental water needs in affected river systems, perhaps during Drought Stage 2 under the NSW Extreme Events Policy.

For critical environmental water needs, this could include:

- minimum volumes to pass into the Macquarie Marshes, Gwydir Wetlands, and the Menindee Lakes
- minimum flows in the Barwon River at Dangar Bridge (near Walgett), in the Darling River at Bourke, and in the Lower Darling River at Weir 32
- critical environmental demands for endangered species and communities
- minimum flows to manage risks to widespread blue-green algae blooms.

These critical environmental needs could take account of:

- environmental needs specified in long-term environmental water plans
- the current Basin annual environmental watering priorities
- asset and ecological condition
- water quality and other relevant information.

Critical human and environmental needs could be specified in consultation with DPIE-Water and local councils, DPIE-EES, DPI Fisheries, the CEWO, Ramsar site managers and other subject matter experts.

As part of clarifying and confirming the quantum of critical human water needs, and giving the community confidence, it is important that NSW completes and releases Reasonable Use Guidelines (s.336 of the *Water Management Act 2000*) as soon as possible.

2. **That greater priorities under the *Water Management Act 2000* are met first**

In a first flush event, the default should be that lower priorities, such as use against general security or supplementary licences, cannot take until higher priority uses are met or forecast to be met in that river system and downstream connected river systems. Achieving these higher priority needs may take several flow events, particularly in rivers further downstream including the Barwon-Darling. During a severe water shortage, the risks associated with future flow uncertainty ought to be borne by lower priority users rather than unmet critical needs, consistent with the priorities under the Act.

3. That NSW announces 324 orders as many days in advance as possible of any first flush event. The minimum should be three days in advance.

In 2019 and 2020, events protected by 324 orders in the northern Basin originated from ex-tropical cyclones. Days before the rain started the Bureau of Meteorology predicted heavy rainfall.

The 324 order for the 2019 event in the Namoi and Macquarie catchments was gazetted and announced at least a day after the rainfall started. There were questions after the 2019 event regarding the effectiveness of the communication of the gazettal and whether the intent of the *Water Management Act 2000* was achieved. At a time when the Barwon River had ceased to flow over long distances there was significant take of water in the Namoi and Macquarie valleys¹.

The publication of the 324 order for the 2020 event prior to the flow was important, although there was a contentious temporary relaxation of the order during the event. To protect a first flush event, lower priority users should be advised that they cannot take until further notice, rather than that they can take until further notice. This includes the CEWH as a holder of general security and supplementary licences. Proactive, early communication would improve planning certainty for water users and assist with subsequent compliance activities.

4. That NSW analyses whether the need for first flush events is expected to increase as a result of climate change.

Analysis of the frequency, scale and losses (including seepage into the riverbed) under climate change scenarios is important information for the management of future first flush events.

Examples of cease-to-flow events since 1975 across the northern Basin over are provided in Attachment A. Clearly cease-to-flow events in the northern Basin appear to be occurring more often and for greater durations during the last twenty years than the preceding two decades.

5. That NSW develops and implements rules in water sharing plans that provide for greater connectivity throughout the northern Basin and reduces the need to stop flows and ‘shorten’ rivers as a water conservation measure.

NSW currently allocates water to water licence holders based on an assumed inflow series. In some catchments, this inflow series is not the worst on record, or the worst that could be expected given climate change and the relatively brief period of flow records. Allocated water has been taken back and re-allocated to drought reserves. Additionally, extreme water conservation measures, like moving delivery points upstream, stopping flows, and ‘shortening rivers’ have been implemented because less water was available than expected. Reaches of rivers have been dried out to save water, putting aquatic life at risk, including native fish and freshwater mussels. Following the drying out of sections of river, more water is required to restore flows due to high initial loss and seepage.

The draft Barwon-Darling Water Sharing Plan includes a provision of 30 GL to restart the river from Bourke to the Menindee Lakes. If the Menindee Lakes are dry and there are acute social and environmental needs in the lower Darling, then we believe that 30 GL is inadequate. NSW could consider inserting rules into upstream water sharing plans, including the Barwon-Darling Water Sharing Plan, requiring a greater volume being provided or forecast to be provided before irrigation

¹ <https://www.mdba.gov.au/sites/default/files/pubs/monitoring-flows-namoi-macquarie-warrego-18-oct-2019.pdf>

take is allowed. This could be a volume equivalent to 12-18 months supply for high priority needs, similar to what was adopted in the 2020 first flush event.

NSW could consider inserting provisions into water sharing plans so that water accounted against the Commonwealth's Warrego River licenses could be passed to the lower Darling for its immediate benefit (a transparent/translucent flow rule) without requiring a 324 order. The enacting of the provisions would be subject to the request of the CEWH and may be subject to the support of NSW environmental agencies.

It is not clear whether the current water sharing plan architecture implements the Interim Unregulated Flow Management plan for the North-West, which was intended to contribute to connectivity in the northern Basin.

6. That NSW analyses past experiences of first flush events with respect to the risk of fish death events to help inform management of future events, and that NSW publishes this analysis.

The fish death event in the lower Darling in 2019 attracted national and international interest. There were also many other fish death events across the Basin².

Cease-to-flow events result in native fish populations being confined to isolated refuge waterholes. The deepest of these waterholes can become stratified, with low oxygen levels near the riverbed. When flows start after long hot periods or after bushfires this can impact on water quality. The amount of dissolved oxygen in the water can drop quickly. A reduction in oxygen can result in the death of large numbers of fish and other aquatic biota. If the first flush is a trickle, the front of the flow may have very low dissolved oxygen. Further, when the first flush comes, and the refuge waterhole is mixed, the resulting dissolved oxygen may be fatally low throughout the waterhole. Larger flow events into these isolated waterholes are more likely to provide conditions that fish can survive in. The learnings from these past events should inform the management rules of the future.

7. To reduce the use of 324 orders, that NSW completes and implements active management across the NSW part of the northern Basin

To improve water planning certainty, 324 orders should only be implemented in exceptional circumstances. If NSW uses 324 orders for less exceptional circumstances, such as to protect environmental water drawn out of accounts, then the community might unnecessarily contest some environmental flows.

It is suggested NSW protects planned environmental water draw from accounts, such as allocations in the Gwydir and Macquarie catchments, using active management. For example, flow from the Gwydir planned environmental water account was directed to the Barwon River as part of the Northern Fish Flow, a first flush event, and in the future the protection of such a flow should be provided by active management rather than a 324 order.

8. That DPIE-Water consults with and actively engages with environmental water managers prior to and during first flush events.

DPIE-Water did not seek the input of the CEWO during the 2020 flow event, possibly on the grounds of managing market sensitive information. DPIE-EES and the CEWO have responsibilities with regard to the management of Ramsar sites and protecting and restoring environmental values under the Basin Plan. During a first flush event, trade is extremely unlikely, and if a 324 order is in place, water entitlement holders cannot use water. Trade of supplementary water after the lifting of a 324 order is unlikely. It is recommended that DPIE-EES should be consulted about critical environmental needs as the primary NSW agency responsible for managing these natural assets: that the holding of water licences is not seen as an impediment.

9. That, during first flush events, NSW publishes advice on the status of 324 orders at the same time on a specified and widely accessible medium.

² For lists of fish death events in NSW refer to: <https://www.dpi.nsw.gov.au/fishing/habitat/threats/fish-kills>

Multiple NSW agencies published information at various times during the 2020 first flush event. This contrasted with the Lower Balonne system (Queensland) where the announcements of water availability during an unregulated flow event were made in one place at a similar time every day.

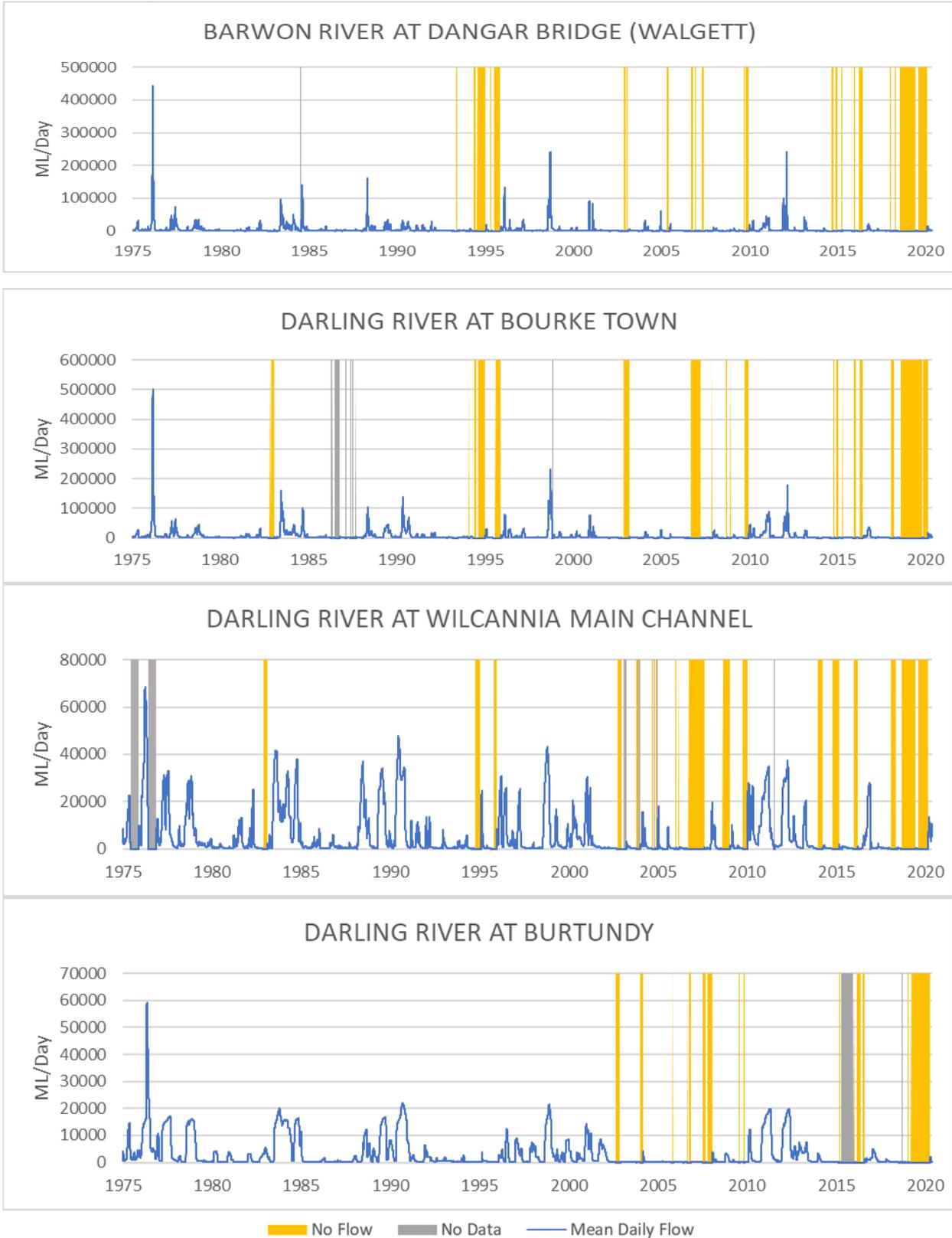
NSW could have one website where information is released at the same time every day. Announcements and 324 orders need to be clear and unambiguous. Exemptions should be minimised.

10. Following a first flush event, that a responsible agency publishes a report on the events for the whole of the northern basin

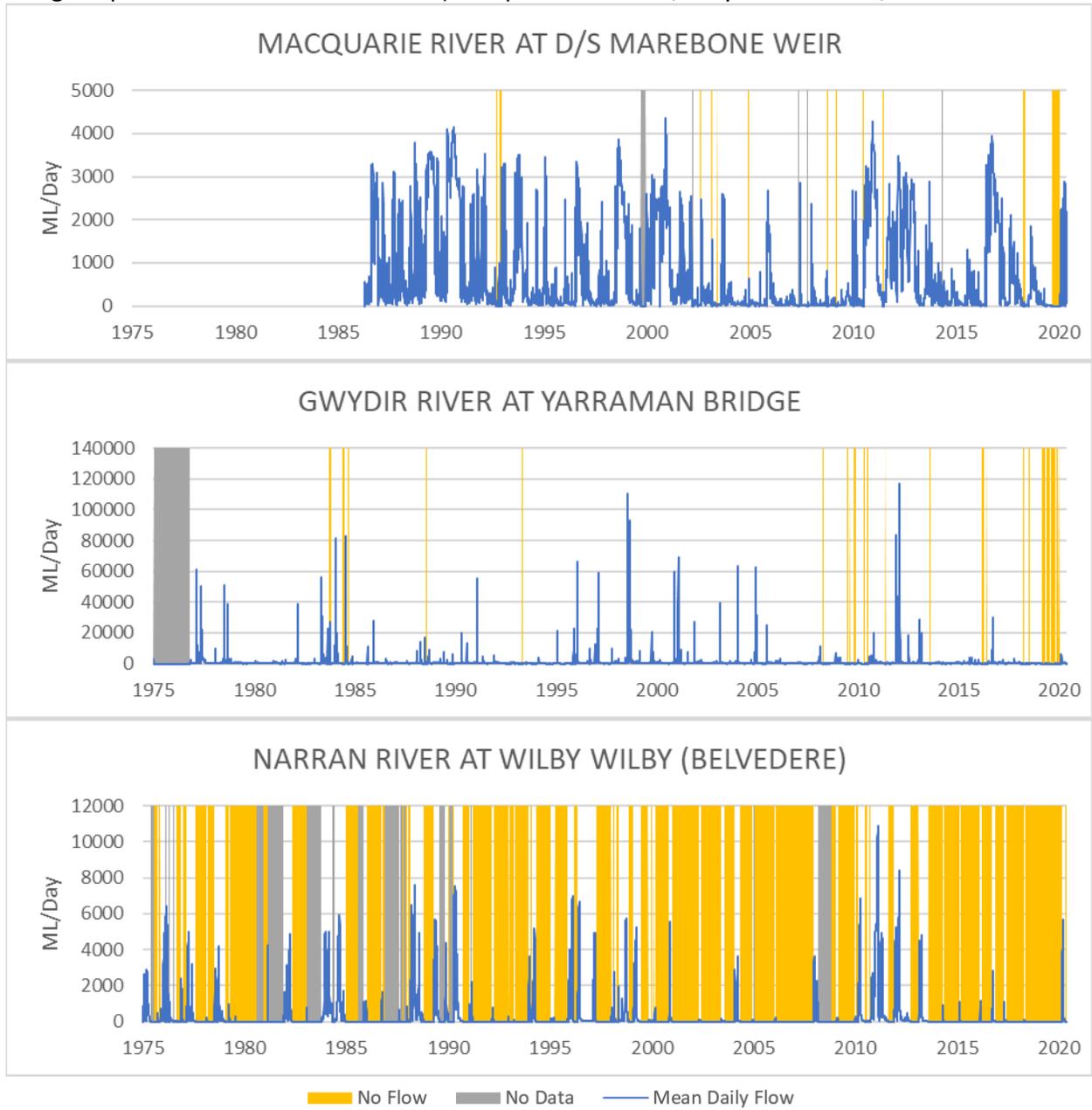
Given the importance of first flush events, learning from each event is important. A hydrological analysis using data from flow gauges and management arrangements across the whole northern basin would be useful. The independent reviewers could consider identifying an agency that it believes is best placed to do this.

Attachment A - Examples of cease-to-flow events across the northern Basin. The orange lines represent cease-to-flow events.

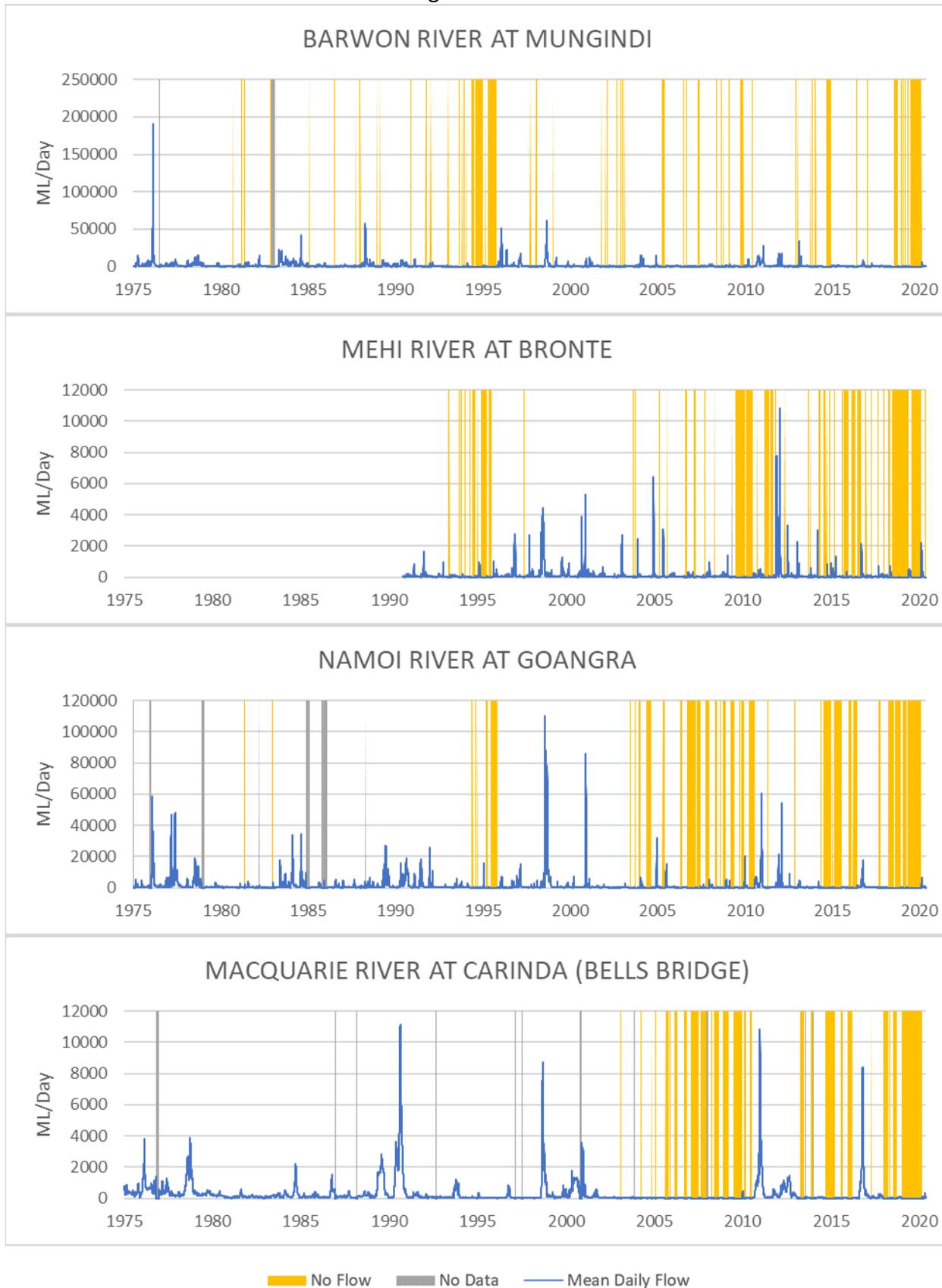
Barwon-Darling



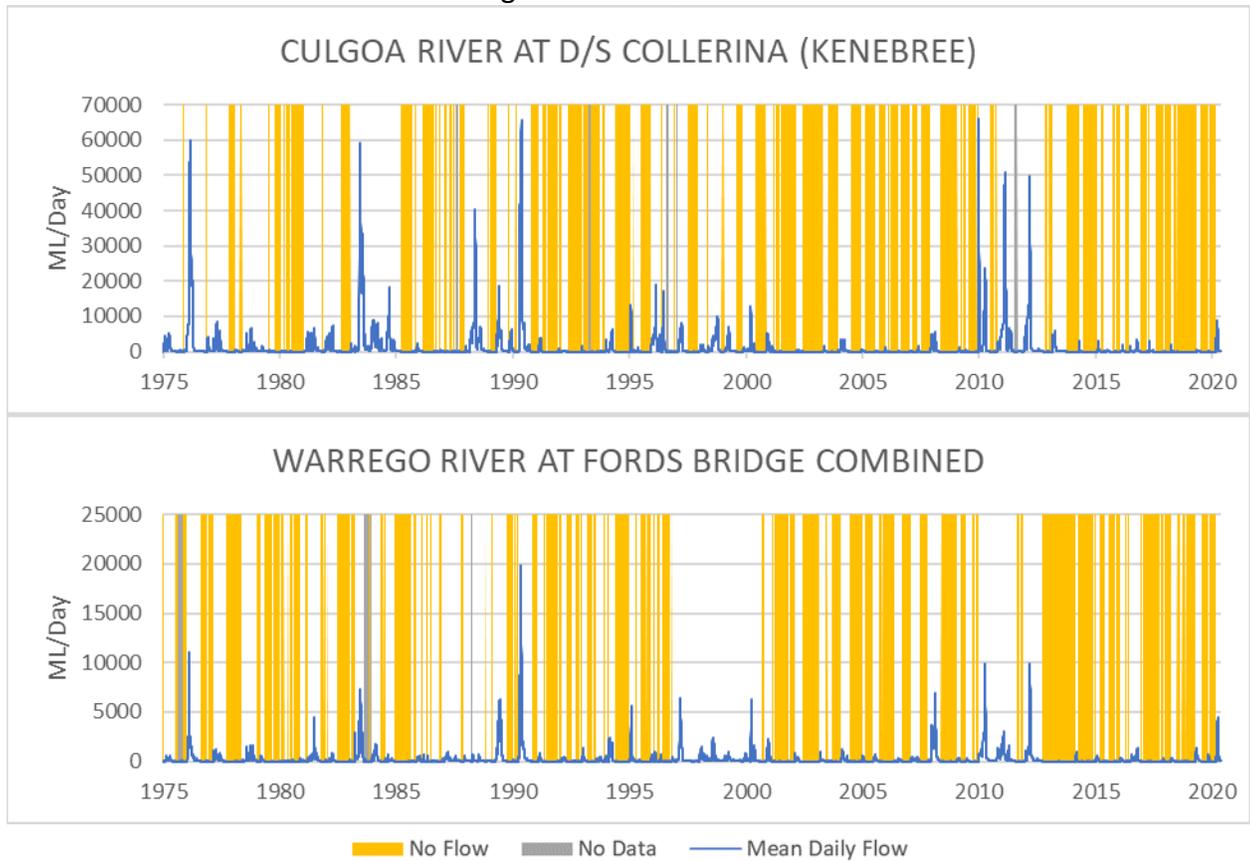
Gauges upstream of Ramsar wetlands (Macquarie Marshes, Gwydir Wetlands, and Narran Lakes respectively)



Main NSW tributaries of the Barwon-Darling



Some tributaries to the Barwon-Darling that rise in Queensland



(Note data from Fords Bridge is used for the Warrego River rather than data from Dicks Dam, as the period of record is less at the latter. When the flow in the Warrego River stopped at Fords Bridge then the river would almost certainly stop at Dicks Dam).