

Vegetation outcomes from the north-west flow event in 2020

Why did we protect flows for native vegetation?

Temporary restrictions on water take were put in place under section 324 of the *Water Management Act 2000* when widespread rain was predicted in drought-affected areas of the Northern Basin in early 2020. The department issued the restriction orders to ensure town supplies were replenished, basic landholder needs were met and to avoid critical and irretrievable loss of water-dependent species and ecosystems.

Wetlands and rivers support a variety of flood-dependent vegetation types with different watering needs. During extended dry periods like the most recent drought, larger flow events are needed to help provide flood-dependent vegetation with the water they need to recover from severe water stress.

Initial flows, or 'freshes', prime the channels to improve the efficiency of subsequent flows. Nutrients for plants are distributed by the flows, while fringing vegetation like river red gums are supported and seedbank is protected.

By supporting the needs of vegetation, we also protect habitat and food resources for birds, fish, reptiles and frogs.

What were the benefits?

Outcomes for the Macquarie Marshes

The Macquarie Marshes contain Ramsar-listed wetlands and are an important nesting site for waterbirds. The Marshes also have important river red gum forests, coolibah woodlands and extensive reed beds.

The temporary restrictions aimed to protect flows to core wetland areas in the Macquarie Marshes. Satellite imagery was used to track wetland inundation progress. Images show flows in February 2020 primed the streams in the southern Marshes. This allowed the efficient transmission of follow-up flows through to the northern Marshes.

By the end of April 2020, over 30 gigalitres (GL) had been delivered and around 2,600 hectares (ha) of the critical northern reed bed inundated. Plate 1 shows the progress of flows over the three months between February and April.

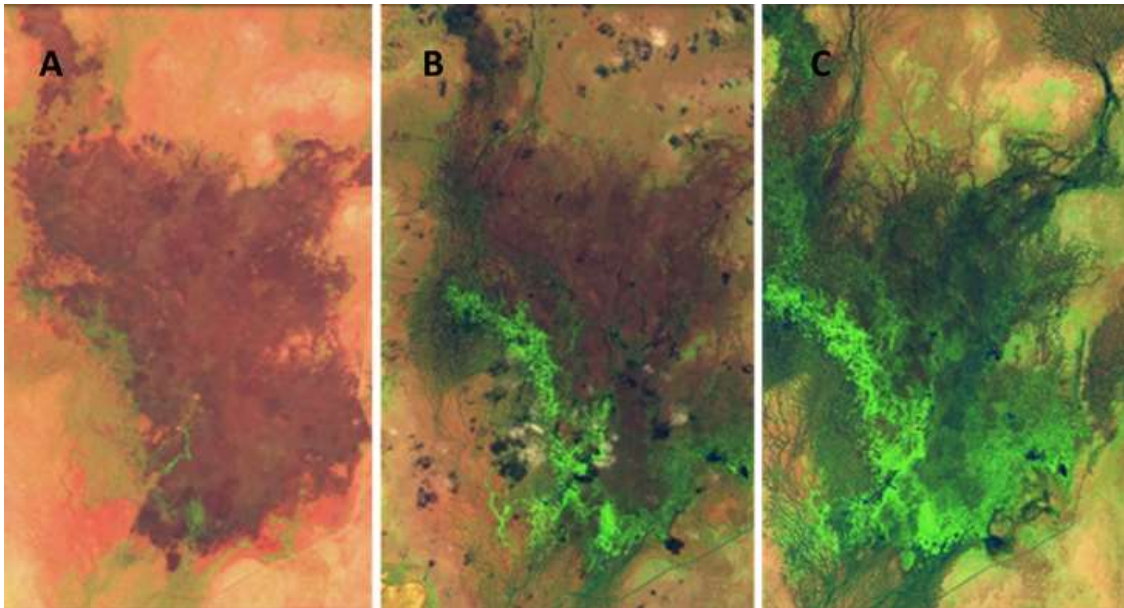


Plate 1: Sentinel imagery showing the progression of flows to the Macquarie Marshes. A. 2/02/2020 – 0GL @ Pillicawarrina @ Gauge; B. 31/03/2020 – 17.8 GL @ Pillicawarrina Gauge; C. 15/04/2020 – 30.7 GL @ Pillicawarrina Gauge (Source: Water and Wetlands Team – DPIE-EES)

Protecting the flows to the Macquarie Marshes was particularly important as a fire in the northern Marshes in October 2019 caused damage to 3,000 ha of the reedbed and some river red gum woodland. While the reedbed had re-sprouted from rainfall in early 2020, it urgently needed water to replenish root zones and ensure continued growth of the reeds.

Outcomes for the Gwydir Wetlands

The Ramsar-listed Gwydir Wetlands are also located in the Northern Basin. The Gingham and Lower Gwydir Wetlands support waterbirds and the critically endangered marsh club-rush sedgeland. During the temporary restrictions, flows reached the core reedbeds by end of January 2020 and expanded during February and early March.

In the Gingham, more than 1,700 ha of common reed, cumbungi and water couch wetlands were inundated and responded well to this inundation. In the Lower Gwydir, more than 1,800 ha of the wetland communities were inundated. This will facilitate the recovery of aquatic vegetation in these areas when the drought breaks (Plate 2).



Plate 2. Vegetation response in the Gwydir wetlands following flow delivery to core wetland areas in the central Gingham wetland (Photo: DPIE-EES 13 March 2020).

In-channel and riparian vegetation outcomes

Base flows and small to large ‘freshes’ are important for protection and maintenance of in-channel and riparian vegetation. These types of flows were delivered to Northern Basin rivers and streams, including the Narran Lakes, throughout February to April 2020 and are expected to support riparian and in-channel vegetation.

In the Gwydir, small freshes were delivered between 13 and 25 February 2020. Freshes will also benefit riparian and in-channel vegetation in the Macquarie Marshes. Large freshes were delivered between 25 – 29 February 2020, 12 – 16 March 2020 and again from 8 – 23 of April.

These flows have been identified as crucial in maintaining in-stream and riparian vegetation in the Macquarie Marshes.

Summary of benefits

Preliminary results indicate that protected flows reached the intended ecological assets in the Northern Basin and resulted in:

- The inundation of core wetland areas, generating beneficial floodplain vegetation responses.
- Critical flow targets for the support and maintenance of riparian and in-channel vegetation being met on numerous occasions across multiple water sources, with examples from the Gwydir and Macquarie outlined above.

Ongoing native vegetation monitoring

The vegetation responses to these flows at targeted locations in the Northern Basin will continue to be monitored to inform future water management decisions. More information on all monitoring, evaluation and reporting (MER) activities can be found in the surface water MER Plans for the [Gwydir](#) and [Macquarie-Castlereagh](#).