

Department of Planning and Environment

Reconnecting River Country Program

Environmental benefit and risk analysis:
Murrumbidgee River



Yarradda Lagoon. Photo: Amelia Walcott

About the Reconnecting River Country Program

The Reconnecting River Country Program is about improving flow connectivity to wetlands, riparian and floodplain vegetation communities through relaxing flow constraints in the southern-connected Murray-Darling Basin including the Murrumbidgee River.

A constraint is any physical, policy or operational barrier limiting the flow of water in river systems. There are a range of flow constraints in the basin, meaning rivers connect to their floodplains less often than is needed to maintain healthy river, wetland and floodplain ecosystems. The program aims to remove or relax these constraints.

Removing or 'relaxing' constraints allows water for the environment to be periodically delivered at higher levels and at more appropriate times.

Program benefits

Improving environmental flow delivery will support the recovery of native plants and animals in our rivers, wetlands and billabongs. Importantly, the program will provide long-term generational physical, emotional, economic and wellbeing benefits associated with positive ecological outcomes. It also has the potential to provide important economic benefit to local communities in southern NSW.

The NSW Government will collaborate with stakeholders to ensure issues are identified and a range of tools developed to mitigate potential effects before making changes to existing rules, policies or infrastructure.

About the Environmental Benefit and Risk Analysis

What we assessed

The Environmental Benefit and Risk Analysis is a major component of the flow options analysis and evaluation process being undertaken by the program. It assesses the potential environmental outcomes of the flow options being explored across the following themes:

Benefits



Native fish Lateral connectivity Waterbirds Ecosystem production Wetland and floodplain vegetation

Potential risks



Water quality River form Invasive weeds

For each theme, potential environmental outcomes were measured using the best-available science, scientific models and expert knowledge including:

- the best available scientific information on the types of flows native fish, waterbirds and vegetation require to complete their life cycles and be in healthy condition
- hydrological modelling representing the potential system-wide flow patterns using currently available volumes of water and the different flow options being investigated
- inundation mapping providing an understanding of the potential areas to be inundated under the flow limit options being assessed.

Flow limit options being assessed¹

	Flows at Wagga Wagga (Megalitres per day)
Base case	22,000 ¹
Option 1	32,000
Option 2	36,000
Option 3	40,000

¹ The current temporary operational limit at Wagga Wagga is 22,000 megalitres per day

About the Murrumbidgee River project area

The project area includes the Murrumbidgee River, its floodplain and network of anabranches and creeks (including the Yanco Creek system and Beavers and Old Man creeks).

Important wetland systems in the area include:

- the Mid-Murrumbidgee Wetlands, which includes 1,600 floodplain wetlands
- the Lowbidgee Floodplain, including Yanga National Park, Gayini/Nimmie-Caira and other extensive wetlands
- the Junction Wetlands where the Murrumbidgee and Murray Rivers meet.

The wetlands and waterways of the project area support a diverse range of native plants and animals, some of which are threatened or in decline.

This includes:

- 15 native fish species (e.g. trout cod, Murray cod, golden perch, freshwater catfish), with a further four small bodied wetland species targeted for reintroduction
- 77 waterbird species
- platypus, turtles and at least six species of flow-dependent frogs.

What we learned – Murrumbidgee River program benefits

Native fish



The study shows an up to 34 per cent increase in golden perch numbers in the Murrumbidgee River between Gundagai and Balranald under flow limit options compared to the base case.

Regionally, golden perch could increase up to 47 per cent in the Gundagai to Hay reach and up to 32 per cent in the Hay to Balranald reach.

In dry years, golden perch numbers could increase up to eight times in the Gundagai to Hay reach (weir gates are opened for higher flows, allowing fish to move) and up to 30 per cent in the Hay to Balranald reach.

This increase in numbers of native golden perch will provide opportunities for increased recreational fishing and associated tourism across the local region.

Increased flow limits would also support population recovery of small native fish relying on regular access to wetlands to breed and complete their life cycles.

Estimated increase in average golden perch (yellow belly) numbers



¹ Options 3a and 3b are paired with Murray flow options of 40,000 and 45,000 ML/d, respectively. The greater outcomes in the Murrumbidgee River under 3b are due to increased golden perch numbers in the Murray River, which are able to migrate into the Murrumbidgee River.

Lateral connectivity (wetland inundation)



Up to 48 per cent more wetlands between Burrinjuck Dam and Hay could be reached by environmental flows under flow limit options compared to what is currently possible.

Estimated increase in wetlands potentially reached by higher environmental flows between Burrinjuck Dam and Hay



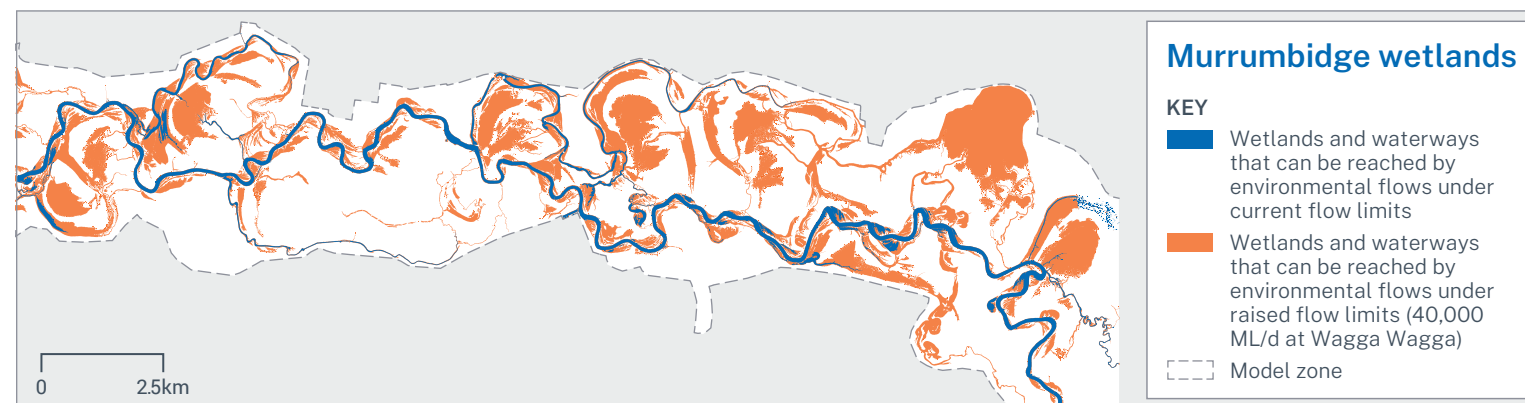
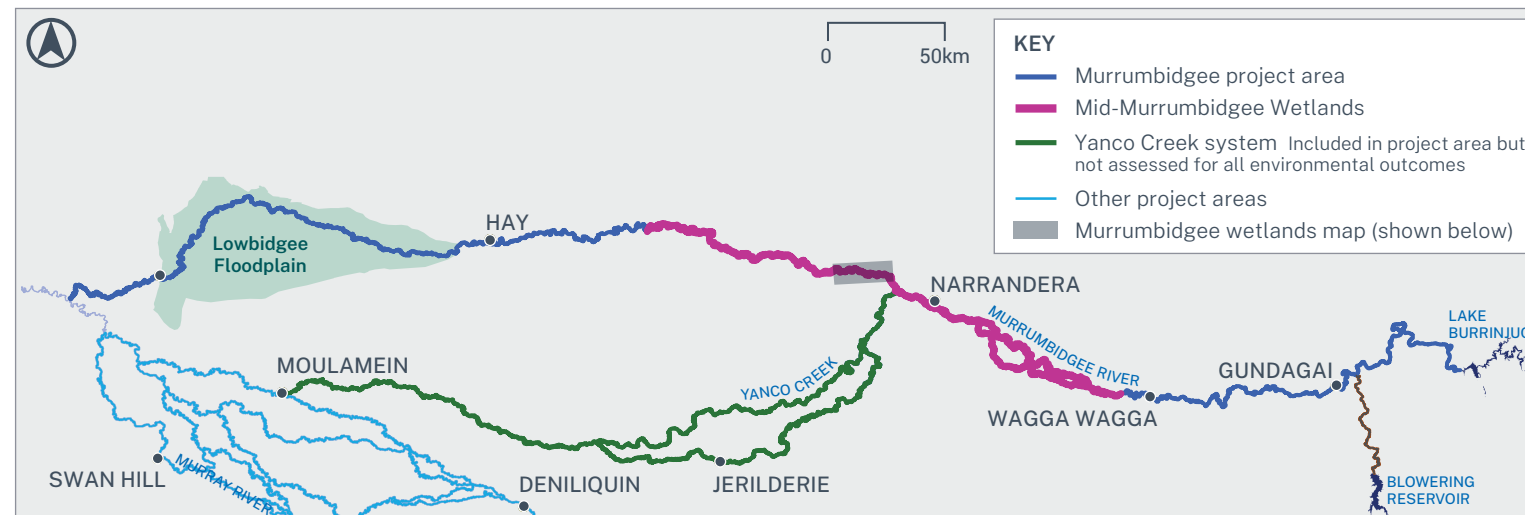
Connecting wetlands more often means health declines during long periods of dry could be slowed and recovery could be quicker.



Example of a healthy Mid-Murrumbidgee wetland in 2000 during a period of frequent watering (pre-Millennium drought). Photo: James Maguire



The same wetland in poor condition in 2010 after an extended period of dry during the Millennium drought with no opportunities to support with water for the environment. Photo: Carmen Amos



Ecosystem production



The study tells us increased flows can grow the availability of food and energy for native fish and other animals within the system by up to 11 per cent in the Burrinjuck Dam to Hay study area. This would provide increased food availability for native fish and other aquatic animals during critical times and has the potential to support increased breeding and recruitment.

Wetland and floodplain vegetation



The study tells us raised flow limits would support up to double the area of native vegetation in wetlands and on low-lying floodplains in the study area between Burrinjuck Dam and Hay compared to what is currently possible.

What does this mean for vegetation health?

The study shows raised flow limits would increase the area of healthy river red gum communities in the Burrinjuck Dam to Hay study area by up to 6 per cent on average and by up to 23 per cent during dry periods. The program would also mean improved soil moisture and healthier ecological communities leading to an overall increase in environmental health along the Murrumbidgee River.

Waterbirds



Waterbird ecologists expect more frequent and longer watering of the Mid-Murrumbidgee wetlands to benefit waterbirds by increasing the health and area of foraging and breeding habitat and complementing benefits from Murray River constraint relaxation.

The data available for modelling in the Mid-Murrumbidgee wetlands was collected during a time of poor wetland health and low waterbird numbers. This is likely to have influenced modelling results, which predicted no material change in waterbird numbers.

More information

The program is being led by the Department of Planning and Environment's Water Infrastructure NSW in partnership with the department's Environment and Heritage Group, the Department of Regional NSW's Local Land Services and the Department of Primary Industries, Fisheries.

The program is currently identifying and evaluating flow and impact mitigation options for further investigation in the next stage of the program. Options analysis is part of the requirements under the **NSW Government Business Case Guidelines**, as well as under the **Infrastructure NSW Infrastructure Investor Assurance Framework**.

Scientific, technical and operational analysis is being undertaken to support options evaluation. Options

Water quality



The study finds no increased risk of adverse water quality events under the flow limit options. In fact, benefits to water quality are likely, due to the potential to bring forward the timing of some high flows from the warmer months (late spring/ summer) to cooler months earlier in the season (winter/ early spring).

River form



The study finds a low to medium risk that raised flow limits may influence current rates of river bank erosion and other geomorphic processes. Water management techniques and potential works can reduce the risk from medium to low in all river reaches. For example, environmental flows can slow the rate of fall in river levels. The department is considering this and other measures such as potential works to reduce risks associated with raised flow limits.

A benefit of raised flow limits includes maintaining river features like benches, pools and natural levees, and improving nutrient transport to the floodplain.

Invasive weeds



The weed risk assessment shows a small overall decrease in weed impact under the flow limit options compared to the base case, including a decrease in weed hotspots. The study predicts reduced suitable habitat for some water-based weeds and increased suitable habitat for some land-based weeds. Overall, the study shows a slight overall net benefit (reduced weed impact) for flow options two and three and a slight increase in risk in flow option one.

Weed management plans may be required to address potential increases in weed distribution and impact for certain species in some locations.

evaluation will also incorporate local knowledge and expertise through collaboration with landholders, Aboriginal people and other stakeholders.

To find out more about upcoming consultation opportunities please contact us (details below) or get in touch with your local engagement officer.

Acknowledgement

The Department of Planning and Environment and the Department of Regional NSW's Local Land Services acknowledge we stand on Aboriginal land. We acknowledge the Traditional Custodians of the land and we show our respect for Elders past, present and emerging.

Contact us

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