



# INVESTING IN FARMS AND TOWNS TO IMPROVE RIVER HEALTH IN THE SOUTHERN MURRAY-DARLING BASIN

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## KEY MESSAGES

Governments have an opportunity to invest \$864 million of already allocated funds in river-side farms and towns to improve the health of rivers in the southern Murray-Darling Basin (MDB). This investment will return much greater benefits by reducing flood risks, enhancing farm businesses, upgrading local infrastructure and improving environmental health. Specifically:

1. Governments agreed in 2013 in the MDB Constraints Management Strategy to reconnect rivers to six floodplain areas covering 375,000 hectares by 2024 (Figure 1) but implementation has stalled;
2. The focus areas are vulnerable to flooding: the risk of damage to farms and towns would be reduced by the proposed projects;
3. State government business cases propose to spend \$864 million funding over 3,300 landholders for occasional inundation of their flood-prone pasture lands (~95,000 hectares), for farm infrastructure upgrades; and to relocate or strengthen bridges, roads and levee banks (Table 1);
4. However, the states' business cases for these projects lack consistency and focus on costs without assessing the wider social and economic benefits;
5. Systematic assessment shows that the projects provide extensive benefits that could greatly improve acceptance of constraints relaxation amongst landholders;
6. Unless governments find a way to enable overbank flows then hundreds of thousands of hectares of floodplain wetland ecosystems will be lost and the Basin Plan will not achieve its environmental objectives;
7. Over bank flows are essential to sustain wetland ecosystems such as redgum forest, populations of water birds and fish (like the iconic Murray Cod), prevent black water events and flush salt to sea;
8. Under the Basin Plan's 'Sustainable Diversion Limit Adjustment Mechanism' 5 of 6 of these constraints relaxation projects must be fully operational by 1 July 2024. If they are not implemented, considerably more water entitlements (possibly several hundred gigalitres) could be recovered by the Federal Government from agricultural users for river health.

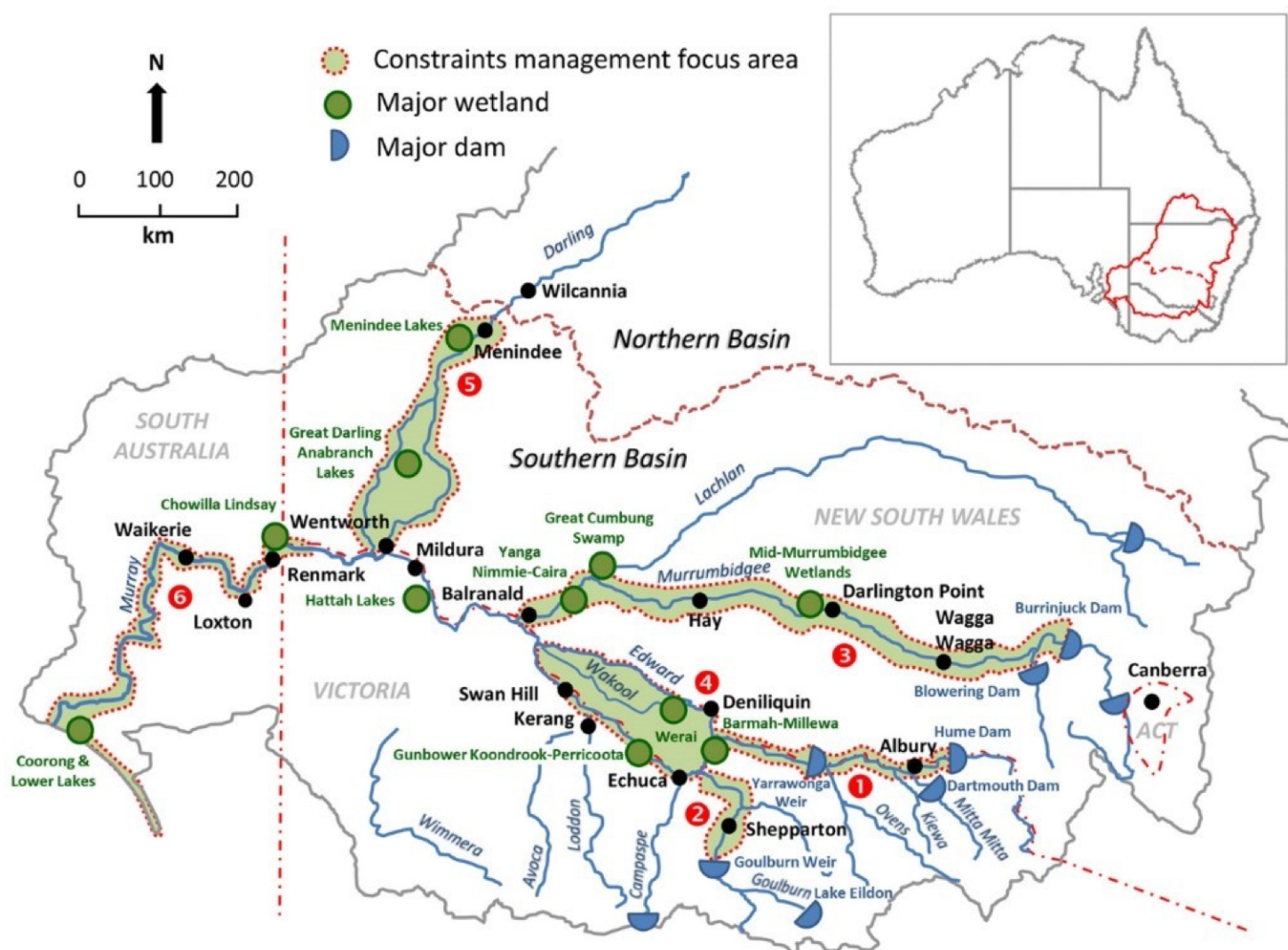


Figure 1. The southern Murray-Darling Basin showing the location of the constraints management focus areas (extent is indicative) and places mentioned in the text: 1 = Hume to Yarrawonga; 2 = Goulburn; 3 = Murrumbidgee; 4 = Yarrawonga to Wakool Junction; 5 = Menindee Lakes; 6 = South Australian Murray

## WHY THIS IS IMPORTANT

Dams that primarily store and divert water for irrigation in the Basin catch small- and medium-sized inflows. This prevents water naturally spilling over river banks to sustain the floodplain forests and other wetland ecosystems, water birds and fish. Further, nearly half of the surface water in the Basin is now taken for irrigated agriculture, reducing the area of wetland habitats that can be watered. Further, climate change is also reducing water availability.

Different plants and animals need overbank flows at different frequencies, ranging from

once a year to once every 15 years if they are to survive and thrive (Figure 2). Conservation of the six million hectares of floodplain wetlands in the Basin increasingly depends on managed environmental flows.

One way of using limited water to maximise the conservation of wetland flora and fauna is to release environmental flows from dams in pulses big enough to fill the river channel and inundate the adjoining billabongs, lakes and floodplain forests. However, this requires watering limited areas of private land and state governments are worried that this may incur compensation claims.

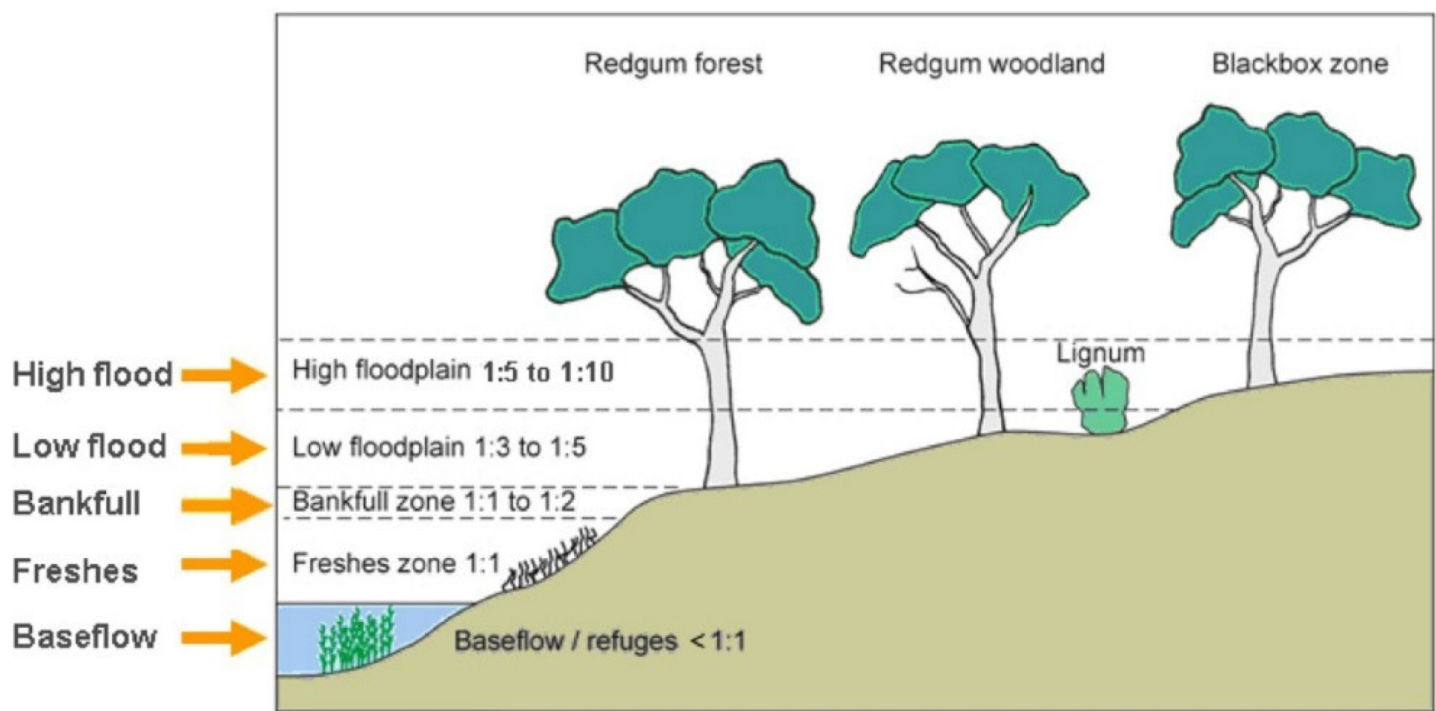


Figure 2: Annual inundation frequency required to keep some key wetlands ecosystems healthy. Source: Overton et al. (2011) Defining hydro-ecological states and estimating water availability to inform environmental watering actions. CSIRO, Canberra

In the obtuse jargon of the water sector, reconnecting rivers to their floodplains is called “constraints relaxation”. In 2013 the state and Federal Governments agreed to take action to relax constraints in the southern Basin, but implementation has stalled. This is the first research to synthesise data on the proposed projects and assess the benefits of constraints relaxation.

## CONTEXT

Under the 2012 Murray-Darling Basin Plan, the Commonwealth Government intends to recover the equivalent of an additional 2,750 GL/yr of water from irrigators to restore the health of wetlands and rivers. However, to conserve wetlands with limited environmental water, managed overbank flows are required.

*Constraints management* involves identifying and addressing the physical, operational and institutional limits to achieve more flexible delivery of environmental water.

The government-proposed constraints relaxation includes relocating or upgrading levee banks, relocation or protection of flood-prone infrastructure and compensation to landholders for any negative impacts from occasional inundation (by purchasing flood easements or by using other mechanisms).

The Murray-Darling Basin Authority's (MDBA) Constraints Management Strategy (CMS) identifies six focus areas in the southern Basin (of which five were assessed; Figure 1). Relaxation of constraints in these focus areas enables coordination of environmental flows from different tributaries to converge

Focus area	Estimated cost (\$m)	No. easements to be negotiated <sup>1</sup>	Area of land to be inundated (ha)	
			Private farmland	Wetland
Hume to Yarrawonga	26-34	207	1,117	8,800
Yarrawonga to Wakool Junction	306	1,513	22,879 <sup>4</sup>	123,000
Goulburn	>140	<562	<8,330	<9,775-11,975
Murrumbidgee	113-164	1,042	53,103	116,408
Menindee Lakes* (Lower Darling)	<152	ND	7,500	
South Australia (Lower Murray)	38-68	ND	9,374	110,860
Total (max.)	864	3,324	94,803	374,793

\* Controversial proposal that is unlikely to proceed

Table 1. Costs and impacts of constraints relaxation in each of the five focus areas. ND = no data. See paper for sources and limitations.

and fill the bigger channel of the River Murray to inundate floodplain wetlands in western Victoria and South Australia. Under the Basin Plan, less environmental water is being recovered under the ‘Sustainable Diversion Limit Adjustment Mechanism’ (SDLAM), including constraints relaxation projects, which must be fully operational by 1 July 2024. A scheduled reconciliation of Mechanism projects mean that if these projects are not operational, then considerably more water entitlements could be recovered by the Federal Government from agricultural users for river health.

As the Basin Plan was adopted, the constraints projects were classified as water ‘efficiency’ measures that could access the \$200 million ‘special account’ fund. Subsequently, 5 of projects have also been classified as part of the 605 GL/yr of ‘supply’ projects under the SDLAM, which have access to nearly a billion dollars of Federal Government funding.

## PROPOSED CONSTRAINT RELAXATION MEASURES

The five focus areas involve an estimated 95,000 ha of private land to be inundated, requiring 3,300 agreements to be negotiated with landholders and benefitting 375,000 ha of wetland at an estimated cost of \$864 million. Works include new or upgraded infrastructure on private and public land, including roads, bridges, crossings, levee banks (Table 1).

## BENEFITS OF CONSTRAINTS RELAXATION

Ecosystem services benefits from constraints relaxation are likely to be considerable, greatly exceeding the one-off \$864 million estimated implementation costs of constraints relaxation. In addition to upgraded local infrastructure, the socio-economic benefits derived from ecosystem services are high across all focus areas, particularly for some provisioning services



(e.g. timber production and floodplain pasture) regulating services (safer flood management, delivery of high-value water, nutrient cycling, water recharge and habitat quality) for cultural services (tourism, recreational fishing, aesthetic appreciation, Indigenous and community values). Constraints relaxation would enable conservation of more wetland ecosystems, reduce flood risk and generate many other benefits without requiring reallocation of more water.

The Institute for Water Futures works collaboratively with stakeholders in government, community and business to understand change and enable action in long term water research, policy and management.

## ABOUT THE AUTHORS

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## MORE INFORMATION

This brief is based on the following publication:

Kahan, G., Colloff, M.J. and Pittock, J. (2020) Using an ecosystem services approach to re-frame the management of flow constraints in a major regulated river basin. *Australasian Journal of Water Resources*  
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