

# The Murray Darling Basin Plan

## Environmental Water and Triple Bottom Line Outcomes – When is Enough Enough?

### Background to Plan

The Murray-Darling Basin Plan was developed to improve the health of rivers and floodplains by acquiring water for the environment, at a cost of \$13 billion to the Australian taxpayer. The Basin Plan was signed into law in November 2012 under the Commonwealth Water Act 2007. The Basin Plan sets limits on how much water can be taken from the Basin for irrigation, drinking water, industry or for other purposes in the future. These limits are called Sustainable Diversion Limits, or SDLs. The SDLs came into effect in 2019.

Water for the environment

The Basin States and the Federal Government agreed that 2,750 gigalitres (GL) of water from across the Basin will be recovered and returned to the environment:

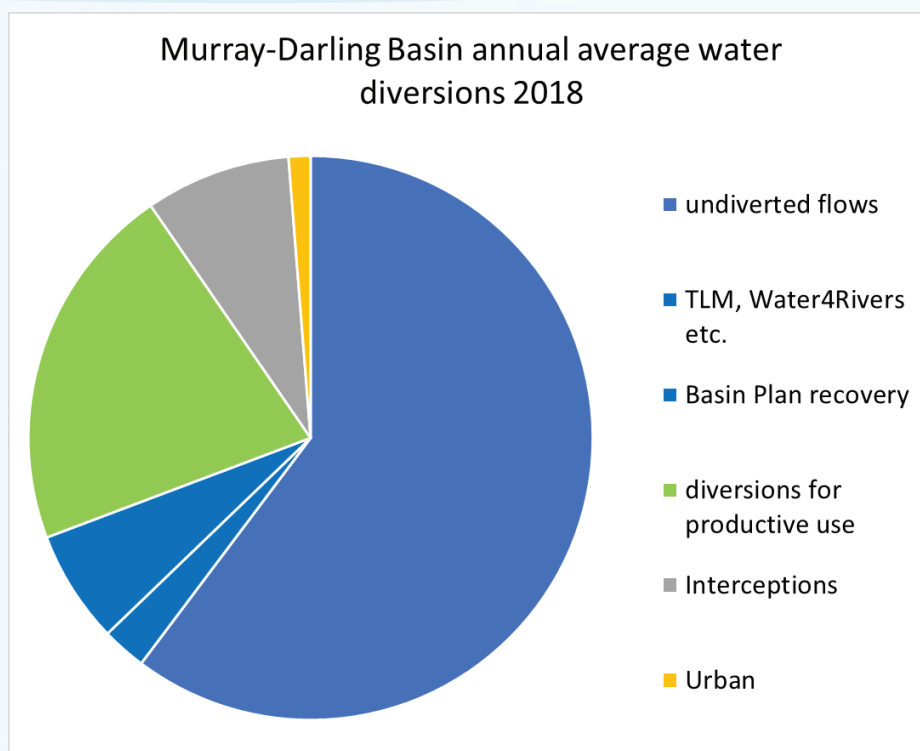
- Most of this water comes from buying water shares from farmers through direct buybacks or efficiency programs, and by making water use more efficient.
- Up to 605 GL (sometimes called 'downwater') can be deducted from the 2,750 GL total by investing in projects that deliver the same environmental outcomes using less water.
- Another 450 GL (sometimes called 'upwater') can be recovered above 2,750 GL to enhance environmental outcomes, provided further water recovery results in neutral or positive socio-economic impacts. A project's potential impacts are assessed by the State where the project is located.
- The 605 GL provision is called the Sustainable Diversion Limit Adjustment Mechanism (SDLAM).

**Note:** These are modelled amounts of water. They have never been peer-reviewed or published in a scientific journal. Most recently (Gell 2019), through robust, peer-reviewed research, showed that the modelling is inaccurate. Several inquiries and reviews have also asked for the modelling to be revisited. An independent panel (Blackmore 2017) also dismissed the modelling approach, recommending that it should be reviewed completely.

Water recovered from consumptive use is used for environmental flows to try to improve the health of the Basin's rivers, wetlands, floodplains, plant and animal habitats.

According to the Murray-Darling Basin Authority, the annual average rainfall in the Murray-Darling Basin is 500,000 GL, which is equivalent to 1000 Sydney Harbours (only 6% or 32, 800 GL makes it into the waterways as inflows) (MDBA 2011a). This was calculated using data from 1895 – 2009. Graph 1 shows the amount of water available to the environment in the blue sections (divided into 3 categories – undiverted flows, pre-Basin Plan recovery, Basin Plan recovery). The remaining sections represent water diverted from rivers. These figures are based on water recovery by the end of 2018.

*Therefore, 70% of the annual flow of the Basin is already available for the environment. That leaves just 21% for irrigated agriculture to produce over 50% of Australia's irrigated produce (MDBA 2014-2015).*



**Graph 1** – Annual average water use in the Murray Darling Basin as per water recovery as of 2018. TLM (The Living Murray), Water4Rivers are pre-Basin Plan environmental recovery programs. (Source: Claire Millar Consultancy)

### **So how much environmental water do the State and Federal Governments already own?**

State and Federal Governments have owned and been delivering environmental water since the 1990s . Most notably with the intergovernmental agreement to invest more than \$500 million to recover 500 GL of water for six icon sites under the 2004 The Living Murray program and \$150 million for water management structures to facilitate delivery of this water. Although it is difficult to assess how much water the environment actually owns, two consultants have produced roughly the same results. Currently in the Southern Connected System (SCS), between the Commonwealth and State Governments there are over 3,900 GL entitlements held by the environment, including rules based water. Of that roughly half is owned by the Commonwealth, and a quarter each to NSW and Vic. SA contributes about 3%.

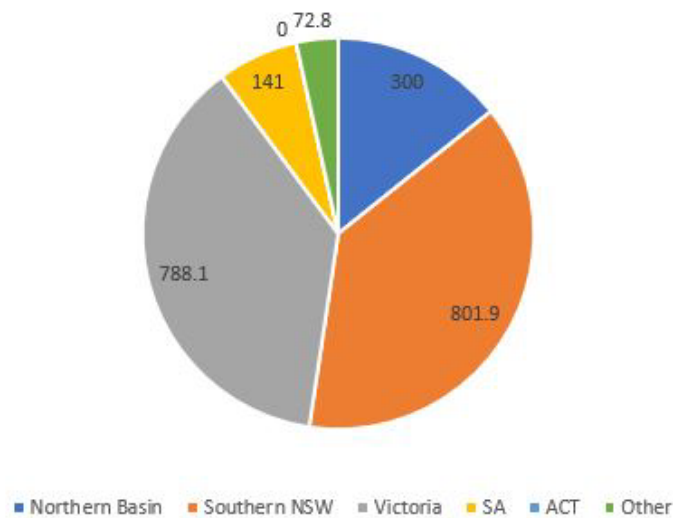
### **Water Recover under the Basin Plan**

**Graph 2** shows water recovery under the Basin Plan across the entire Basin, which has the current long-term diversion limit equivalent factors applied, these were approved by Ministerial Council in 2011 (**MDBA 2019a**). A conversion ratio is used to determine a Long Term Annual Average Yield called LTAAY set by state water sharing plans (**MDBA 2019a**). The LTAAY is used to calculate the amount of water that is available on average compared to the volumes of water entitlements actually acquired. All water users are subject to variability in water availability.

**Note:** The LTAAY conversion factors are set by the states in their water sharing plans. These conversion factors have not undergone external peer-review nor are easily accessible for external review or scrutiny by stakeholders.

1 Murray–Darling Basin Ministerial Council approves an annual Environmental Water Allocation of 100 GL to the Barmah–Millewa forest.

**Water recovery under the Murray Darling Basin Plan (Dec 2019)**  
Gigalitres (GL)

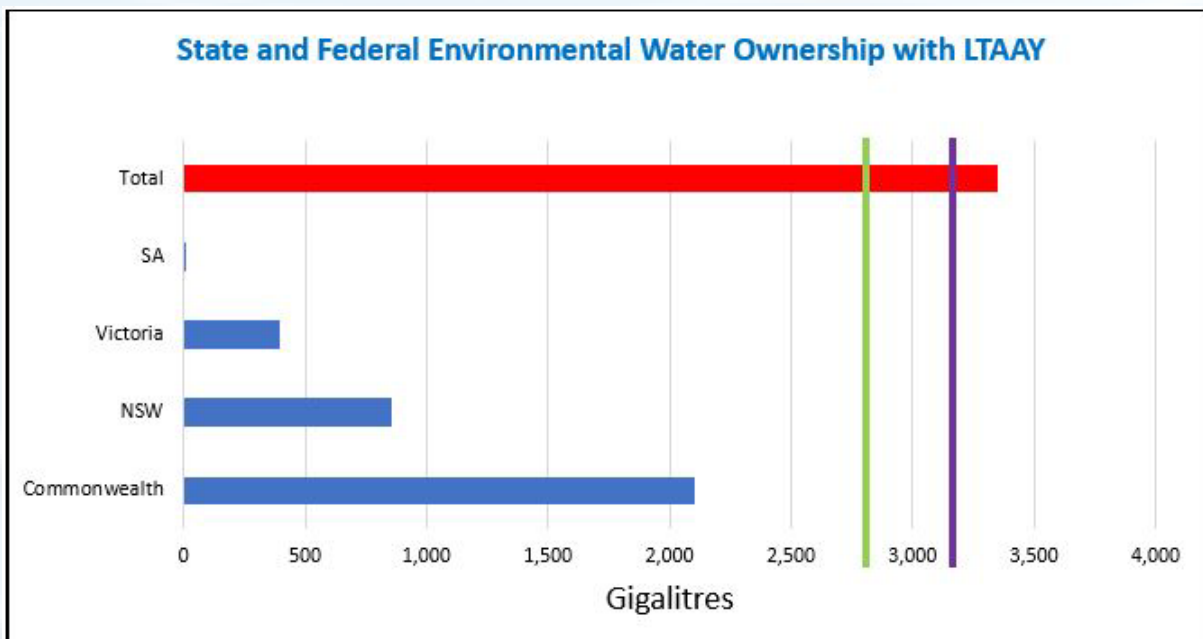


**Graph 2** – recovery of water entitlements under the Murray Darling Basin Plan with the LTAAY conversion applied.

Using the LTAAY 2,104 GL of Commonwealth owned water is available but recovery of this water has been unequally acquired across the basin. Under the Basin Plan the southern NSW (Murrumbidgee, Lower Darling and Murray) and north Victoria (Murray and Goulburn systems) have contributed 76% of water recovery. The Southern Basin has contributed 84% of the water recovered for the environment under the Basin Plan. The ACT is yet to contribute and the Northern Basin has contributed 16%.

**Graph 3** applies the LTAAY to State (SCS) and Commonwealth water ownership. Using the LTAAY conversion factors, the Commonwealth now owns 2,104 GL LTAAY of water (entire Basin). With the addition of State environmental water in the SCS, this comes to just over 3,300 GL LTAAY. Please note these figures are approximate, with the best data accessible at the time.

**State and Federal Environmental Water Ownership with LTAAY**



**Graph 3** – Water ownership with the LTAAY conversion factor applied. The green line represents the 2750 GL of water recovery and the purple line represents water recovery including the 450 GL of Upwater (if recovered). Note: Commonwealth ownership includes both Northern and Southern Basin.

## **Delivery constraints and impacts of government owned water – these have real impacts on rural people.**

Under the Basin Plan, the delivery of environmental water assumed the current delivery constraints could and would be relaxed, but the people who would be most impacted under this 'relaxed constraints' delivery scenario were never consulted, prior to the constraints strategy being legislated. Under this scenario, significant impacts from flooding will occur to private land almost every year, putting more financial and emotional pressure on landowners and their families and communities, already being impacted by the Basin Plan. The relaxation of constraints has never been agreed upon and committed to, as such large volumes of environmental water cannot be delivered without massive third-party impacts. This includes negative consequences for the environment in areas where physical constraints occur. Yet more water recovery is planned by the government.

### ***What the constraints really are and why the proposed volumes can't be delivered***

The MDBA definition of constraints states – “constraints are river management practices and structures that govern the volume and timing of regulated water delivery through the river system”.

There are two types of constraints – physical and operational.

**Physical Constraints** – This includes channel carrying capacity, structures such as bridges, roads and levee banks, along with privately and publicly owned infrastructure which restricts the volume of water. **Operational Constraints** – These are river management constraints which include carryover rules and management of airspace in dams, rules that limit the height of river flows, and the rise and fall rate of river levels.

**Channel Capacity** – The three major rivers of Murray, Goulburn and Murrumbidgee all have 'chokes', which are sections of the river that naturally narrow and limit the volume of water which can be delivered per day:

- **Goulburn River** - The Basin Plan proposes using Environmental Water to boost river flows to 20, 000 ML/day at Shepparton almost every year (**MDBA BPRO**).
- The Molesworth Choke is located between Yea and Alexandra in the Goulburn River. The channel capacity is 9,500 ML a day (MDBA 2015). Above this volume water flows over bank and floods adjoining property causing significant social and economic impacts
- Therefore, even with the 20,000 ML/day proposed at Shepparton, there is a danger that private property will be flooded which will mean the loss of crops and stock feed. Together with natural flood events food producers will be negatively impacted by flood more often than not, and land was not acquired or valued under these conditions.
- **Murray River** – The Basin Plan proposes using Environmental Water to boost river flows to up to 50,000 ML/ day downstream of Yarrawonga almost every year (**MDBA BPRO**).
- The Murray has many narrow sections, or 'chokes', restricting the volume of water that can be delivered per day. The most well-known and monitored is the Barmah Choke, in the Barmah -Millewa Forest near Mathoura.
- When the Guide to the Basin Plan was released in 2012, the Barmah Choke had a capacity of 8,500 megalitres a day (**MDBA 2012**)
- Now the Barmah Choke channel capacity is reduced even further to 7,000 megalitres a day (MDBA 2019). Running high volumes for prolonged periods has resulted in severe, widespread bank erosion, tree collapse/death and sedimentation of the Choke and downstream areas (see photo 1).
  - o Therefore, the flows proposed, will mean private property will be flooded which will mean the loss of crops and stock feed, and other impacts such as land degradation and land value depreciation.
- **Murrumbidgee River** – The Basin Plan proposes using Environmental Water to boost river flows to 40,000 and 44,000 ML/day at Wagga (**MDBA BPRO**).



- River restrictions at both the Tumut Choke and Balranald Choke limit the capacity of the river to 9,000 ML/day (MDBA 2013).
- The Malebo/Pomingalana Gap poses the biggest risk. This is where the 3-4 kilometre-wide floodplain upstream of Wagga narrows to a 650m-wide floodplain within the town of Wagga itself.
- Large volumes of water from the upstream floodplain place huge pressure on the banks in the gap
- Downstream, the floodplain widens to 6km with intensive agriculture at Collingullie.
- Therefore, the flows proposed, will mean private property will be flooded which will mean the loss of crops and stock feed, and other impacts such as land degradation and land value depreciation

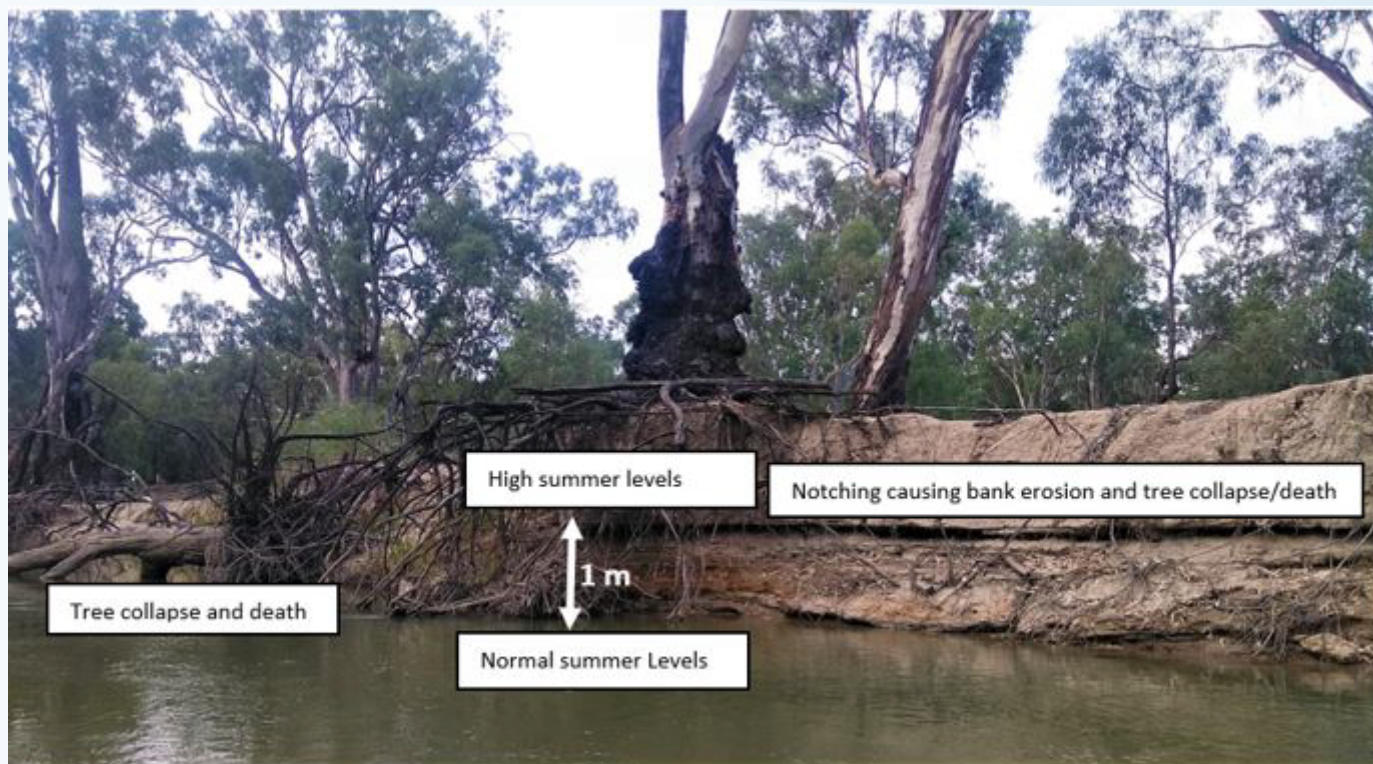
### ***Unintended consequences of flooding events***

Those living on the floodplains expect to live with unregulated floods. However, under the Basin Plan, the frequency and duration of floodplain inundation will be increased, leading to various costly consequences to food and fibre producers including:

- Loss of crops and stock.
- Dispersion, germination and growth of noxious weeds, costing thousands of dollars to control.
- Waterlogging.
- Delays in harvest and sowing.
- Reduced area available for sowing or for feeding stock.
- Increased pest population on properties, such as carp proliferation.
- Decrease in land values due to loss in productive land and inability to farm
- Loss of prime grazing areas for prolonged duration in peak fattening season

For many the purchasing of land and associated titles was done with the knowledge that unregulated floods occurred periodically and that regulated flows did not to impact landholders, unless agreements were put in place. This brought security to the land titles, so land was bought and sold on this premise. Under the Basin Plan and high proposed flows, if they occur, the titles under which the land was purchased no longer represent the current situation. This brings great uncertainty to landholders who want to buy or sell land.

The Murray and the Edward-Wakool systems are already facing increasing environmental damage due to increased flows for downstream purposes. Degradation includes bank erosion, tree collapse, excessive carp breeding and sedimentation. Notching of banks has become a significant problem, with metres of bank lost each season in some areas and thousands of tonnes of sediment released into the river. This increases turbidity and silting problems and adds phosphorous into the system, which is a major contributing factor to blue-green algae blooms. This will only increase in choke areas under further pressure from the Basin Plan. Photo 1 shows the devastating effects of excessive high flows being pushed downstream destroying choke areas in the different river systems.



**Photo 1** - The Edward River 20kms upstream of Deniliquin. Excessively high, constant flow levels are causing 'notching' leading to bank erosion, tree collapse/death and excess sediment smothering instream habitat. This was originally a site where Azure Kingfishers nested, but the birds have not nested since the high flows began and nesting sites collapsed.

### **The socio-economic impacts of the Basin Plan are crippling rural communities, farmers, their families and future generations**

Before the Basin Plan was signed into law, the Commonwealth government judged the socio-economic impacts would be negligible and that the plan represented a balanced triple-bottom line approach. This has not been the case, as communities warned from before the Basin Plan was signed and water acquisition began. Many assumptions have been made about the Basin Plan's social and economic impacts on Basin communities, which have turned out to be wrong. In the Guide to the Murray Darling Basin Plan released in late 2010, the Murray-Darling Basin Authority (MDBA) massively underestimated social and economic impacts when it predicted the Basin-wide loss of \$800 million in production and 800 jobs (MDBA 2011b).

However, independent socio-economic studies have found in the Murray Irrigation footprint alone –

- An economic loss of \$120 million at the farm gate per year
- 30% decrease in rice production and 21% decrease in dairy.
- Murray Irrigation now delivers on average around 750GL/yr compared with 1,350GL prior to the Millennium Drought (RMCG 2017 Stage 1)
- The decrease in farm gate production flows onto another \$77 million loss in value add.
- The loss of a total of 678 jobs, with 471 lost in the contraction of irrigation itself and a further 207 lost due to flow-on effects. (RMCG 2017 Stage 2)

### **While in the Goulburn Murray Irrigation District (2016 data) -**

- Total economic production loss of \$580 million per year
- A 20% reduction in irrigation production, mostly from dairy
- Loss of 1000 jobs (RMCG 2016)
- Decrease in GMID consumptive irrigation pool from around 1600ML/yr to 870ML/yr

## **The MDBA's Basin 2018 community profiles found these impacts:**

- **Berrigan – Finley**
  - o Decrease in irrigation-related employment by 35.4% (FTE)
  - o Decrease in agricultural manufacturing employment by 32.1% (FTE) (MDBA 2018a)
- **Wakool**
  - o Decrease in irrigation-related employment by 71.8% (FTE)
  - o Decrease in agricultural manufacturing employment by 44% (FTE)
  - o Decrease in population 45.6% (MDBA 2018b)
- **Deniliquin**
  - o Decrease in irrigation-related employment by 73.1% (FTE)
  - o Decrease in non-agricultural employment by 16.7% (FTE)
  - o Decrease in population 12.2% (MDBA 2018c)

Question – With the constraints in the system, why has the overwhelming majority being recovered from the SCS where it cannot be delivered without significant environmental and socioeconomic impacts? Any further water acquisition or water recovery will obviously have serious consequences for rural communities and food security for certain commodities in the SCS, along with further environmental damage in these choke areas.

## **Way Forward**

### **Enough water has been recovered**

The environment now has access to an annual average 70% of the water flowing into the Murray-Darling River Basin (subject to unmetered and unlicensed flood plain harvesting). Environmental ownership of entitlements in the SCS alone equates to 3900 GL of water for the environment (or 30% of all diverted flows in the MDB). Given the majority of water has been recovered in the SCS, delivering these volumes with the natural constraints in the system will have numerous economic, social and environmental impacts, and there is no agreed way forward on relaxing constraints where landholders agree to increased flows flooding their property.

### *Recommendations:*

1. Stop further acquisition of water entitlements for the environment until we have a stakeholder agreed way forward to deliver the water already recovered and show success with water now owned by the state and Commonwealth governments.
2. Invest the remaining MDB Plan funds into an evidence-based, multiple measures approach using a suite of interventions not just aimed at water recovery to achieving the desired environmental outcomes – healthy ecosystems in unison with a triple bottom line (see Baumgartner et al 2020 for way forward).
3. Implement the Blackmore et al (2017) recommendation: 'The establishment of a stable, agreed, clear and accessible benchmark as the basis upon which to assess a range of supply measures is critical.'

**NB** – It is assumed by many that the worst is nearly over with water recovery under the MDB Plan, however there is still the implementation of the Sustainable Diversion Limit Adjustment Mechanism (SDLAM) and the recovery under the 405GL of upwater. Some of the projects under the SDLAM pose considerable risks to the environment in some areas, along with the third party impacts of delivering the additional water and the economic impacts to individuals and communities if the constraints are relaxed without an agreed way forward.



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