



# **Submission to the Inquiry into the Water Amendment (Restoring our Rivers) Bill 2023**

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## **A. Executive Summary**

The proposed Water Amendment (Restoring our Rivers) Bill 2023 is a significant opportunity to deliver on the restoration of the rivers and wetlands of the Murray-Darling Basin and the ecosystem services they provide for the many communities that rely on them. To maximise the benefits of the legislation, this submission puts forward 18 proposed recommendations.

### ***Recommendations***

*Recommendation 1 – Commit to delivering the 3,200 GL/year of water for the environment.*

*Recommendation 2 - Lift the legal limit of 1,500 GL on Commonwealth purchase of water for the environment.*

*Recommendation 3 – Establish a structural adjustment package for affected communities with opportunities to diversify into new industries, including renewable energy.*

*Recommendation 4 - The proposed Bill amendment should be supported in relation to delaying offsets' projects until 2026.*

*Recommendation 5 - There needs to be clear accountability mechanisms for reaching environmental equivalence for all new offset projects, with independent assessment.*

*Recommendation 6 - Ensure that legislation provides for an audit and report on all floodplain works in relation to the Murray-Darling Cap 1995 for individual river valleys and their relationship to Sustainable Diversion Limits.*

*Recommendation 7 - The effects of growth in farm dams needs to be captured and regulated in relation to Sustainable Diversion Limits for each river valley.*

*Recommendation 8 - Establish mechanisms for transparently and rigorously reporting on Sustainable Diversion Limits annually.*

*Recommendation 9 - Ensure that states are compliant in meeting Sustainable Diversion Limits by establishing penalty processes with independent oversight by the Inspector-General or the to be established national Environment Protection Authority.*

*Recommendation 10 - Transparently report on the liabilities and legalities of flooding private land with environmental water.*

*Recommendation 11 - Consider establishing an independent third party to negotiate and deliver 'constraints' projects.*

*Recommendation 12 - Adopt the recommendations of the Australian Competition and Consumer Commission in relation to regulation of water markets.*

*Recommendation 13 - Increase understanding of the socio-economic and environmental*

*consequences of water markets.*

*Recommendation 14 - Increase First Nations ownership of water in the Murray-Darling Basin and increase capacity to engage in water resource policy and management, including through ongoing Indigenous Ranger programs.*

*Recommendation 15 - Link flow targets to environmental objectives within Water Resource Plans.*

*Recommendation 16 - Protect environmental water between river systems so that it is not extracted.*

*Recommendation 17 - Ensure that climate change is incorporated into Sustainable Diversion Limits.*

*Recommendation 18 - Protect planned environmental water from a disproportionate impact of climate change, compared to other users.*

## **B. Background**

Professor Kingsford has a long track record of involvement in the management and policy of water resources in the Murray-Darling Basin. He is the Director of the Centre for Ecosystem Science (CES), UNSW Sydney. The research Centre he leads supports instruments of government, including strategies that improve effectiveness of conservation of the environment, founded on a strong evidence base. Researchers in CES have established track records in the research and management of Australia's biodiversity, both within and outside protected areas, with a strong focus on freshwater ecosystems and their management (<https://www.ecosystem.unsw.edu.au/>). Professor Kingsford also has a long involvement in water management in Australia, providing advice to governments and communities based on the most up to date science.

## **C. Need for the Murray-Darling Basin Plan and proposed amendments**

This legislative amendment is critical to getting the restoration of the rivers of the Murray-Darling Basin back on track. It is an important initiative for delivering sustainability to the rivers and ecosystem services of the Murray-Darling Basin. There are a range of aspects relevant to successful delivery of the Murray-Darling Basin Plan which have failed to deliver what was a bipartisan federal initiative, because of poor implementation. It was never going to be an easy reform, given the scale of restoring the rivers and challenges for restructuring agricultural interests and need to improve engagement with indigenous communities. This submission focuses on important elements of the proposed Water Amendment (Restoring our Rivers) Bill 2023.

Our research has continued to identify long-term declines in the health of the Murray-Darling Basin rivers and wetlands, including wetlands for which we have international

obligations under the Ramsar Convention (Kingsford et al. 2017). Many of the major declines in ecosystem health, reflected in waterbird population declines, relate to effects of river regulation and diversion of water for irrigation upstream of major floodplains of the Murray-Darling Basin as well as climate change (Grafton et al. 2022). Most recently, the 2018-2019 drought resulted in rivers like the Macquarie River running dry. Our river surveys indicated reports of deaths of iconic species such as platypus resulting from drying rivers. During this period and in 2023, there were also massive catastrophic fish kills at Menindee on the Darling River. While primary causes related to lack of oxygen, effects of blue-green algal processes and barriers to fish movements, the long-term effects of reduced flows from increasing diversions from the Darling River and its catchments were a key cause (Australian Academy of Sciences 2019, NSW Chief Scientist and Engineer 2023).

In relation to the proposed amendments, it is also important to consider the costs of not recovering the water for the environment. This range of costs are not adequately estimated but fundamental to assessing and minimising socioeconomic impacts of changes in river flow regimes. These include impacts such as the effects of the fish kills and related cleanup required, lack of drinking water to towns along the river systems and loss of recreational opportunities for communities living on the river. These are all improved with adequate flows and their management. There is also the deep significance and importance of healthy rivers for communities, particularly First Nations people. There are also costs for those who own or lease land along the rivers of the Murray-Darling Basin, where productivity of that land has decreased with reductions in flow. This is reflected in poor ecological health of flood dependent vegetation such as floodplain eucalypts, reducing growth of vegetation for livestock.

#### **D. Recovery of 3,200 GL/year of environmental water**

There is a fundamental need to reach the water recovery of 3,200 GL/year. This is because this estimate was always a significant compromise on achieving river health. Even with this amount of water there will be significant ongoing loss of floodplain ecosystems over coming decades. Management of flows during dry periods will also be significant, with an emphasis on maintaining connectivity and water in refugia for fish, turtle and platypus populations. There are two key components of this water target, completing the task of delivering the 2,750 GL/year of water for the environment, promised under the Basin Plan and recovery of the additional 450 GL/year. These are essential and important targets to be achieved and necessary to restoring the health of the Murray-Darling Basin rivers. This requires the legislative change of lifting the 1,500 GL cap on Commonwealth purchases for the environment and will need to be supported by structural adjustments for affected communities.

***i. Recovery of 2,750 GL/year of environmental water***

Currently, 2,109 GL/year of environmental water has been recovered, with the remaining water dependent on offsets (SDLAM projects) to deliver 605 GL of environmental water. These have largely failed and are inadequate. There is a need to recover the full amount of environmental water for this target as soon as possible. The most efficient and cost-effective way of meeting this target is to use water buybacks, unless there are considerable changes to the projects put forward by the state governments to ensure that there is environmental equivalency in relation to the offset SDLAM projects (see detail below).

***ii. Recovery of 450 GL/year of environmental water***

There is also a need to deliver the 450 GL/year of environmental water. Unlike the 2,750 GL/year, there is considerable political and legal uncertainty in relation to this quantity of water which is subject to considerable lobbying pressure. It is essential that this water also be delivered to the rivers of the Murray-Darling Basin for their sustainability and the other industries and communities that depend on water in natural systems (e.g. First Nations, river towns water supplies, floodplain grazing industry, tourism, fishers, bird watchers), other than the irrigation industry. This target of water recovery will take time to achieve and will rely on a range of different projects to be put forward by communities and state governments. It is critical that the water provided to the environment is a 'real water' allocation. To achieve this, there will be a need for industry adjustment mechanisms to ensure that communities are not too adversely affected. In addition it is critical that this work be transparent and rigorous in relation to long-term impacts (Wheeler et al. 2023).

***iii. Structural adjustment for affected communities***

There are opportunities for targeted structural adjustment to assist agricultural industries which are currently affected by restoration of river systems. This needs to apply not only to the producers but also support services and industries. However, this should also ensure that impacts to irrigation industries and individuals are based on rigorous economic analyses that do not overstate the costs, recognising that irrigation property taken out of production can move into dryland production, still potentially delivering primary production or other goods and services.

***Recommendation 1 – Establish a legal commitment to delivering the 3,200 GL/year of water for the environment.***

***Recommendation 2 - Lift the legal limit of 1,500 GL on Commonwealth purchase of water for the environment.***

***Recommendation 3 – Establish a structural adjustment package for affected communities with opportunities to diversify into new industries, including renewable energy.***

## **E. Sustainable Diversion Limits Adjustment Mechanism (SDLAM projects)**

It is imperative that such SDLAM projects be reviewed to ensure that their delivery of environmental water is justified for their cost, as well as clarity in relation to the environmental benefits. The NSW Government has put forward the Menindee Lakes SDLAM project, which was meant to be the largest contributor to the 605 GL/year of water under the water recovery target for the Basin Plan. This Menindee project had raised serious concerns in the community for its lack of rigour and transparency.

Our analysis of the Menindee Lakes SDLAM project, the largest under consideration by governments in the Murray-Darling Basin, exposed serious cost implications for a project that was not value for money (Ford et al. 2023). It had a poorly developed evidence base and promised to deliver efficiencies which would have inevitably degraded an important environmental asset in the Murray-Darling Basin – the Menindee Lakes. It clearly failed the environmental equivalency test. Our analysis of the evidence space used for decision making identified significant problems with governance and interpretation of value for money (Ford et al. 2023).

This Menindee project still offers potential in terms of water savings, but it needs to be based on strong evidence, not only for hydrology but also the dependent ecosystems. Our analysis indicated there was very poor assessment of environmental benefits both at the local and larger spatial scales, resulting from significant costs for engineering works to reconfigure Menindee Lakes. There is still a need to assess the management of the Menindee Lakes and attempt to develop it as a restoration project with some water savings, rather than a water savings project only. This would secure good value for money.

There are major lessons in the decision-making which need to be adequately incorporated into such projects meant to deliver value for money as well as provide water for the rivers of the Murray-Darling Basin. Such large projects equally need to be reviewed in relation to their delivery of environmental water, as opposed to potentially providing private benefits at public cost in terms of water savings. Water efficiency was a fundamental narrative driver for the Menindee Lakes SDLAM project but with little adequate analysis or incorporation of key issues of environmental sustainability (Ford et al. 2023). Worse, there were clear problems in that the Menindee Lakes SDLAM project was further degrading the environments of the Menindee Lakes to provide water for the environment downstream.

Management of the rivers of the Murray-Darling Basin need to recognise the incredibly complex nature of these systems compared to our current relatively poor knowledge of the importance and behaviour of flow and flooding patterns. It is important to ensure that efficiency is not interpreted simply as an engineering concept, as this does not acknowledge the importance of water contributing to floodplains and groundwater systems. Most importantly, there needs to be a net positive outcome in terms of water for the

environment from such projects. It is not sufficient for states to just propose projects without an open and independent assessment process to build public trust. In particular, clear commitment and accountability to scientific rigour is essential.

***Recommendation 4 - The proposed Bill amendment should be supported in relation to delaying offsets' projects.***

***Recommendation 5 - There needs to be clear accountability mechanisms for reaching environmental equivalence for all new offset projects, with independent assessment.***

## **F. Sustainable Diversion Limit compliance**

There is a major need to ensure compliance in relation to Sustainable Diversion Limits for individual river valleys. These include four key areas: floodplain harvesting management and regulation; effect of growth in farm dams; ensuring transparency, rigour, reporting and penalising non-compliance to SDLs and; future assessment of Sustainable Diversion Limits.

- i. ***Floodplain harvesting.*** It is important to ensure that extractions from floodplain harvesting and development of parts of floodplains are adequately assessed. There needs to be a transparent audit of all floodplain works, in relation to the Murray-Darling Basin Cap 1995, set at 1993/1994 levels of development in all southern states and 1998/99 levels in Queensland. There remains considerable uncertainty about the amount of water subsequently diverted with infrastructure developments on floodplains, after governments of the Murray-Darling Basin made the collective decision to cap diversions.

Some assessments have indicated an increasing number of floodplain storages, indicative of increasing diversions (Australian Academy of Sciences 2019, Brown et al. 2022). This is particularly relevant for the Darling River catchments in New South Wales and Queensland. Further, there is a need to investigate the effects of the Australian Government's investments in efficiency works, as well as private investments in efficiency measures which may capture overland flows. This was highlighted in the ABC Four Corners Report focused on storages developed on the floodplain of the Murrumbidgee River but is more widespread (Rubinsztein-Dunlop 2019). The investment in efficiency developments also probably affects groundwater recharge but may lead to increases in diversions (Wheeler et al. 2020). A rigorous analysis of the infrastructure in place at the time of the Murray-Darling Basin Cap needs to be completed with an assessment of water take and then compared with current levels of infrastructure and their take of water. Differences should be incorporated into decisions around access, sustainable diversion limits and licencing to floodwaters, including the environment.



- ii. **Farm dams.** There has been little analysis of the long-term effects of proliferating farm dams in the catchments of the major rivers of the Murray-Darling Basin. These inevitably reduce run-off into the major rivers, affecting supply of water for irrigation and the environment. These were estimated to increase by 8% by 2030, reducing annual runoff by an additional 11% (CSIRO 2008). Analyses for Broadwater Creek, an upstream catchment in the Border Rivers, demonstrated such effects (Schreider et al. 2002). State governments have generally poorly regulated this issue and not assessed the effects. There needs to be an analysis of the growth in farm dams and their effects on flows and impacts on Sustainable Diversion Limits.
- iii. **Transparency, rigour, reporting and penalising non-compliance to SDLs.** There is a significant need to improve the transparency and rigour of reporting on SDLs. These should independently be reported each year to ensure compliance. This can occur with other metrics of annual reporting on extractions, flows and inundation.

There is a need for improved oversight by the Commonwealth Government of the implementation of the Basin Plan by states and the territory. There is considerable variation both between and within states in relation to the level of implementation of the objectives of the Basin Plan and compliance to SDL limits. This should encompass annual reporting of extractions, flows and also modelled estimates to establish public trust in the management of the rivers of the Murray-Darling Basin.

In the past, the National Competition Council (NCC) was able to advise on levels of delivery of programs by the states, offering a compliance mechanism. If states and territory did not meet their obligations, then there was a mechanism where the Australian Government through the NCC could restrict funding to those states not complying. This mechanism could be considered for inadequate management to SDL limits, potentially through the Inspector-General of Water Compliance or potentially a future national Environmental Protection Authority.

- iv. **Assessing Sustainable Diversion Limits.** In the long-term, there needs to be a mechanism for assessing the SDLs and in particular in relation to their sustainability for environmental and economic values. SDLs were never adequately assessed in relation to environmental sustainability and were largely set to reflect current baseline water use by industry at the time. If these could be reviewed, incorporating potential socioeconomic and environmental impacts, there may be opportunities to improve water recovery at the Basin scale. For example, the Macquarie River is considered to be over recovered and yet the ecological condition and data for the Macquarie Marshes, one of the more important Ramsar-listed, internationally important, wetland sites indicates otherwise (Thomas et al. 2011, Kingsford et al. 2017). The SDL for this river system was never based on any environmental sustainability assessment.

A clear opportunity for examining the definition of the SDL and water recovery exists for the Lachlan River. This is currently considered almost fully recovered in relation to environmental water but specification of the SDL, which determines the cap, was similarly never focused around the environmental impacts of river regulation. The ecological health of many floodplain communities in the Lachlan River catchment are in serious decline, making the specified SDLs a poor reference base-line for sustainability. Diversions upstream have detrimentally affected downstream ecosystems in the Booligal Creek floodplains and the Great Cumbung Swamp (Armstrong et al. 2009, Murray-Darling Basin Authority 2012b, a). A major contributing factor is the inefficient irrigation infrastructure in the Lachlan River catchment. Governments could invest in improving these efficiencies and potentially providing a dividend of water for irrigation use but also generate savings that would contribute to the overall flow targets for the Murray-Darling Basin. This would deliver real sustainability outcomes for the environmentally important wetlands of the Lachlan River. There may be other catchments where such an approach would also work.

***Recommendation 6 - Ensure that legislation provides for an audit and report on all floodplain works in relation to the Murray-Darling Cap 1995 for individual river valleys and their relationship to Sustainable Diversion Limits.***

***Recommendation 7 - The effects of growth in farm dams needs to be captured and regulated in relation to Sustainable Diversion Limits for each river valley.***

***Recommendation 8 - Establish mechanisms for transparently and rigorously reporting on Sustainable Diversion Limits annually.***

***Recommendation 9 - Ensure that states are compliant in meeting Sustainable Diversion Limits by establishing penalty processes with independent oversight by the Inspector-General or the to be established national Environment Protection Authority.***

## **G. Delivery of water for the environment ('constraints')**

There have been considerable delays in relation to constraints projects, related to costs and feasibility. These projects relate to the ability to use environmental water to flood private land for biodiversity benefits. These are areas that would have naturally flooded: they are floodplains. To maximise environmental benefits, it is essential that floodplains be able to be flooded by environmental water. This not only delivers biodiversity benefits to the river (e.g. native fish populations) but also productivity for the floodplains, which can benefit landholders.

Many 'constraints' projects probably still potentially provide good value for money, but governments are not delivering. It may be worth considering what other options there may be for implementing these projects. Other models may be required, including contracting a

third-party organisation to negotiate and deliver these projects. Before this, there would also need to be a thorough analysis of legalities and liabilities of flooding of private property, given that many of these properties are on private land and were always subject to inundation.

***Recommendation 10 - Transparently report on the liabilities and legalities of flooding private land with environmental water.***

***Recommendation 11 - Consider establishing an independent third party to negotiate and deliver 'constraints' projects.***

## **H. Water markets reform**

There have been many unpredictable consequences of free market reform for river systems. The review by the Australian Competition and Consumer Commission (ACCC) identified a range of important changes needed to redress some of these problems. There is a need to clearly identify both the social and the environmental impacts of water markets. Some of this occurs as water moves to highest value crops, a key objective of the National Water Initiative. For example, the movement of irrigation water from dairy farms on the upper parts of the River Murray to almond industries in the lower Murray has had significant effects on the communities of these different irrigation areas. This also means considerable pressure on the delivery system of the River Murray, with many stakeholders arguing for increasing channel sizes of the 'Barmah choke'. There are likely to be considerable costs, including environmental costs. Unfortunately, much of this market impact is poorly understood broadly within the community and has been used to argue that environmental reforms are significantly impacting the irrigation industry when much of the impact is occurring within the industry.

***Recommendation 12 - Adopt the recommendations of the Australian Competition and Consumer Commission in relation to regulation of water markets.***

***Recommendation 13 - Increase understanding of the socio-economic and environmental consequences of water markets.***

## **I. Indigenous ownership and engagement**

The health of the rivers is fundamentally important to First Nations people who live and depend on ecosystem services, delivered by the rivers. This dependency relates to fundamental human needs such as drinking water, places to recreate and deep cultural and spiritual connections to water.

The drying of the Darling/Barka River and poor ecological health of Menindee Lakes were a fundamental concern for Barkandji communities, custodians of the Barka for tens of thousands of years. There are also concerns that lack of water in the river affects physical

and mental health of communities. It may be socially disruptive to communities with reductions in opportunities for recreation. There is increasing investment in engaging with First Nations people in relation to the rivers and their restoration. This is to be supported and reinforced through programmes such as Indigenous Ranger opportunities. Recent initiatives to include First Nations people in co-design of monitoring programmes also provide considerable co-benefit opportunities.

***Recommendation 14 - Increase First Nations ownership of water in the Murray-Darling Basin and capacity to engage in water resource policy and management, including through ongoing Indigenous Ranger programs.***

## **J. Further opportunities to improve environmental benefits of the Basin Plan**

There are three further key elements which could ensure that current amounts of environmental water under the Basin Plan are maximised for optimal benefit: linking water management planning to environmental flow targets in water resource plans; ensuring environmental flow connectivity between river basins and; incorporating climate change. These could be developed further with state governments.

- i. ***Flow targets.*** To ensure enduring environmental outcomes for the rivers, it will be important to have more explicit linking of water management to environmental flow objectives. Currently, few water resource plans adequately specify environmental outcomes. There is a need for explicit linking of water management in water resource plans to environmental objectives. This would allow more rigorous auditing of the effectiveness of river management and delivery of water for the environment. It will also be important to improved linking and driving of adequate monitoring of environmental objectives and investigating the cause-and-effect relationships relevant for the management of the river system.

There is the need to establish environmental flow targets which span the full flow and flooding regime, related to linking water resource planning to environmental flows. This will be important in not only knowing whether environmental flows are enduring or not, but also understanding what environmental flows cannot currently deliver in relation to the health of our ecosystems. In particular the long-term decline of floodplains needs to be tracked and understood. Acceptance that flow targets may not be achievable is almost certain, but at least this will show which parts of river ecosystems benefit from additional flows and which cannot be delivered given current levels of extraction. With this information, it would be possible to assess likely long-term consequences on ecosystems and their dependent organisms.

- ii. ***Connectivity between river basins.*** A key initiative for ensuring enduring flows, will be the protection of environmental flows between river catchments. Currently many

environmental flows, which extend beyond a particular tributary river are not protected. For example, environmental flows from the Macquarie River are not protected as environmental flows when they reach the Darling River. A key initiative would be to put in place policies which protect these flows so that they not only benefit particular catchments but connect throughout the river system and contribute to whole of system protection. It is no longer acceptable for these environmental flows to be extracted. If environmental flows are subject to extraction, the environmental values of these flows cannot be considered as being protected.

- iii. ***Incorporation of climate change effects.*** The original Murray-Darling Basin Plan did not incorporate climate change. The evidence is that southeastern Australia is drying, with less rain and runoff. There is increasing evidence of increasing temperatures as a result of climate change. A 1°C rise in temperature is associated with about a 15% reduction in annual inflows, based on the historical record, in the Murray-Darling Basin (Cai and Cowan 2008). Across the Murray-Darling Basin, stream flow was projected to reduce by about 20%, under a potential 2°C global average increase in warming, under a median climate change projection for 2060, largely due to increasing temperature and evapotranspiration (Prosser et al. 2021). This inevitably means reductions in flow in the rivers, although not as much as the effects of river regulation (Grafton et al. 2022). This has consequences for the freshwater ecosystems.

With drying catchments and reductions in runoff, positive environmental outcomes will inevitably be eroded, with less quantities of flow in the rivers. It is particularly important to ensure that this reduction does not affect environmental outcomes disproportionately from other users. Planned environmental water makes up most of the environmental water in a river with, on average adaptive environmental water, constituting only about 12-15% of the total environmental water, with planned environmental water constituting 85-88% of all environmental water (Prosser et al. 2021). Current analysis indicates that held environmental water and stored extraction water will be less affected than other sources of water, including unregulated flows and plant environmental water. Otherwise, the environmental values of these flows are disproportionately reduced (Prosser et al. 2021).

***Recommendation 15 - Link flow targets to environmental objectives within Water Resource Plans.***

***Recommendation 16 - Protect environmental water between river systems so that it is not extracted.***

***Recommendation 17 - Ensure that climate change is incorporated into Sustainable Diversion Limits.***

***Recommendation 18 - Protect planned environmental water from a disproportionate impact of climate change, compared to other users.***

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