



I N L A N D  
R I V E R S  
N E T W O R K

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**Submission to NRC review of the  
Macquarie Bogan Unregulated Rivers Water Sources Water Sharing Plan 2012**

The Inland Rivers Network (“IRN”) is a coalition of environment groups and individuals that has been advocating for healthy rivers, wetlands and groundwater in the Murray-Darling Basin since 1991. Member groups include the Australian Conservation Foundation; the Nature Conservation Council of NSW; the National Parks Association of NSW; Friends of the Earth; Central West Environment Council; Healthy Rivers Dubbo and Wilderness Australia.

IRN welcomes the opportunity to participate in the Natural Resources Commission (NRC) review of the *Macquarie Bogan Unregulated Rivers Water Sources 2012 Water Sharing Plan*.

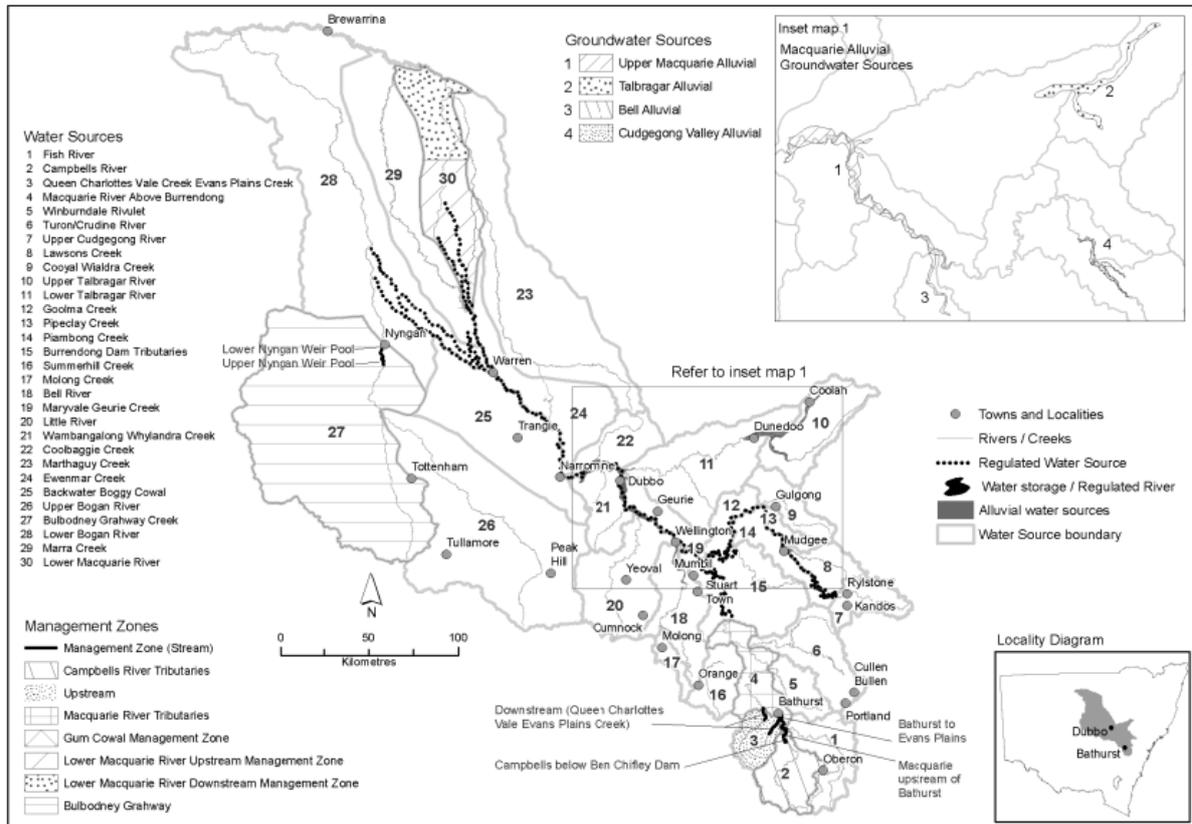
**Context to the water plan’s area**

The terrain covered by the WSP varies widely. In the east the elevation south of Bathurst is up to 1,300 metres above sea level. At the other extreme to the west, the elevation around the Lower Macquarie is about 100 metres above sea level.

The areas covered by the WSP include the entire Macquarie and adjoining Bogan River catchments, excluding the area covered by the *Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source*. The regulated water source area covers 120 km of the Cudgegong River downstream of Windamere dam, and 850 km of the Macquarie River downstream of Burrendong dam.

There are 30 unregulated water sources within the WSP area, which is approximately 74,000 square km. Most of these unregulated water sources feed into the regulated water source area, or the unregulated Bogan River.

The Lower Bogan River, Marra Creek, Mathaguy Creek and Lower Macquarie water sources are fed by water that leaves the regulated water source area.



Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources Background document – page 58.

## Environmental Assets

The water sources that receive water from the regulated system contain the Macquarie Marshes (called Wammerawa by the Weilwan People). This non-terminal wetland situated at the lower end of the region, is one of the most important and largest wetlands in the Murray-Darling Basin. The Marshes are one of the largest semi-permanent freshwater wetlands in south-east Australia; covering about 200,000 hectares. They are recognised as being internationally important because of their size, diversity of wetland types, extent of wetland communities and large-scale colonial waterbird breeding events.

They meet six of the nine Ramsar criteria including:

- representative and unique wetlands,
- support four internationally threatened species on the IUCN Red List and three nationally threatened species listed under the Environment Protection and Biodiversity Conservation Act 1999,

- contain a variety of habitat types that support a diverse range of plant and animal species,
- highly significant habitat for waterbirds that breed in colonies, regularly support more than 20,000 water birds
- provide food source, nurse and migration path for native fish

Seventeen species listed under the international migratory bird treaties (JAMBA, CAMBA and/or ROKAMBA) have been recorded in the Marshes. Vegetation includes River Red Gum woodland, Water Couch grasslands, extensive beds of Common Reed, Coolibah, Black Box, Lignum, reed swamp, Cumbungi and River Cooba. Wildlife includes 233 bird species, 29 species of native mammal, 15 frog species, 60 reptile species and 11 native fish species.

An audit of environmental and cultural assets in the Macquarie against schedule 8 of the Murray-Darling Basin Plan identified areas of water-dependent priority environmental assets that meet all 5 assessment criteria. These include areas:

- subject to discretionary environmental water management, such as the Macquarie Marshes and along regulated streams, including the Macquarie River
- downstream of the regulated system that are also subject to managed environmental flows, such as the Lower Macquarie River (downstream of the Marshes) and the Lower Marthaguy Creek
- supported by implementation of the water sharing plan rules, including regulated and unregulated streams and floodplains

The Macquarie-Castlereagh Long Term Watering Plan (LTWP) contains flow requirements from the regulated system that are required to service the water-dependant priority environmental assets situated downstream of the regulated system.

IRN considers that a strong lever between the LTWP and the WSP is required to ensure the protection of flows from the unregulated system to service schedule 8 priority water-dependent assets.

### **Environmental Condition**

The risk assessment of the Macquarie-Castlereagh that was developed for the draft Water Resource Plan identified high risk of not enough environmental water for the following water source areas (the first three areas listed include the Ramsar listed Macquarie Marshes):

- Marra Creek
- Lower Macquarie (high risk of zero flow, loss of base flow, loss of fresh flow and of no high flows in 1.5, 2.5 and 5 year intervals)
- Mathaguy Creek
- Lower Bogan River
- Upper Bogan River
- Wambangalong Whylandra Creek

- Teridgerie Creek
- Coolbaggie Creek
- Upper and Lower Talbragar River
- Upper Cudegong River
- Turon Crudine River
- Fish River
- Campbells River
- Macquarie River above Burrendong
- Queen Charlottes Vale Evans Plains Creek

The Macquarie Marshes have been declining in size and character rapidly over the last several decades due significantly to the increase of water take upstream (as well as land clearing and settlement). In 2010 at the end of the millennial drought, the Australian Government notified the Ramsar Convention of a likely change in ecological character. The reasons given for the change in ecological character include the changes in flow regime:

*“Inundation mapping of the Macquarie Marshes over the period 1979 to 2006 demonstrates a significant reduction in the frequency, extent and duration of low, medium and high inundation events.”<sup>1</sup>*

### **Floodplain Harvesting**

The controversial practice of floodplain harvesting has been allowed to develop at an exponential rate in the Northern Murray-Darling Basin over the last 30 years. No WSP in NSW has been an effective tool to protect the environment from the unrestricted expansion of this form of free water diversion.

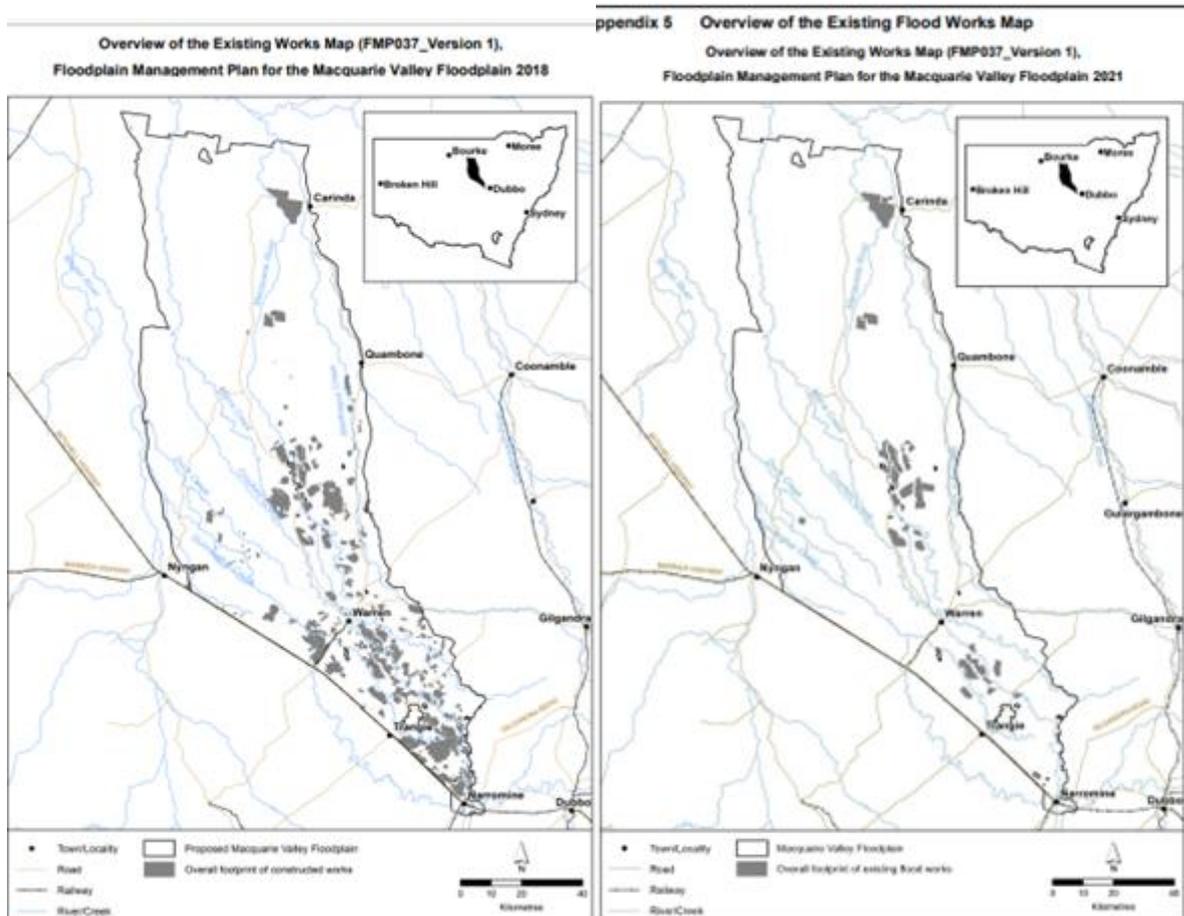
In the unregulated sections of the lower Macquarie and Bogan catchments there are significant numbers of floodplain harvesting structures. In the regulated Macquarie water source downstream of Narromine, there are an even larger number of floodplain harvesting works that divert floodwater and rainfall runoff from reaching the unregulated system, the Ramsar listed Macquarie Marshes and the Barwon-Darling/Baaka system.

Of great concern to IRN is the fact that about two thirds of the floodplain works in the Macquarie Valley have never been approved, which means they have never been assessed for their environmental impact.

The *DRAFT Floodplain Management Plan for the Macquarie Valley Floodplain 2018* shows there were floodplain works around 106,200 hectares on the Macquarie floodplain. In the *Floodplain Management Plan for the Macquarie Valley Floodplain Order 2021* (gazetted September 2021) only 32,600 hectares are shown. (see images below).

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<sup>1</sup> [Likely Change in Ecological Character of the Macquarie Marshes Ramsar Site Statement of Reasons Australian Government Dept of Environment Water Heritage and the Arts](#)



The difference of 73,400 hectares represents unapproved works.

There are 80 unauthorised on-farm storages identified, as identified in answers to supplementary questions asked in budget estimates on 5/11/21.<sup>2</sup> Of those, 69 are being considered eligible for works approval and floodplain harvesting licences, despite never having been assessed for environmental impact.<sup>3</sup> Of those 69, 6 have been identified as works in an identified ‘hotspot’ area as works that impede critical flood flow paths (into the Ramsar listed Macquarie Marshes).<sup>4</sup>

Water Sharing Plans are the legal instrument that is meant to protect the environment, First Nations cultural rights and the rights of other water users. For such enormous levels of unapproved works to be developed and cause an unassessed yet clearly very high environmental impact while Water Sharing Plans are in place indicates there is not enough of a strong legal lever between Water Sharing Plans and what happens on the ground.

<sup>2</sup> [https://www.parliament.nsw.gov.au/lcdocs/other/16468/Answers to Supplementary Questions, Water, Property and Housing AMENDED.pdf](https://www.parliament.nsw.gov.au/lcdocs/other/16468/Answers%20to%20Supplementary%20Questions,%20Water,%20Property%20and%20Housing%20AMENDED.pdf) See (c) on page 15.

<sup>3</sup> [https://www.parliament.nsw.gov.au/lcdocs/other/16468/Answers to Supplementary Questions, Water, Property and Housing AMENDED.pdf](https://www.parliament.nsw.gov.au/lcdocs/other/16468/Answers%20to%20Supplementary%20Questions,%20Water,%20Property%20and%20Housing%20AMENDED.pdf) See (d) on page 15.

<sup>4</sup> [https://www.parliament.nsw.gov.au/lcdocs/other/16468/Answers to Supplementary Questions, Water, Property and Housing AMENDED.pdf](https://www.parliament.nsw.gov.au/lcdocs/other/16468/Answers%20to%20Supplementary%20Questions,%20Water,%20Property%20and%20Housing%20AMENDED.pdf) See (c) on page 16.

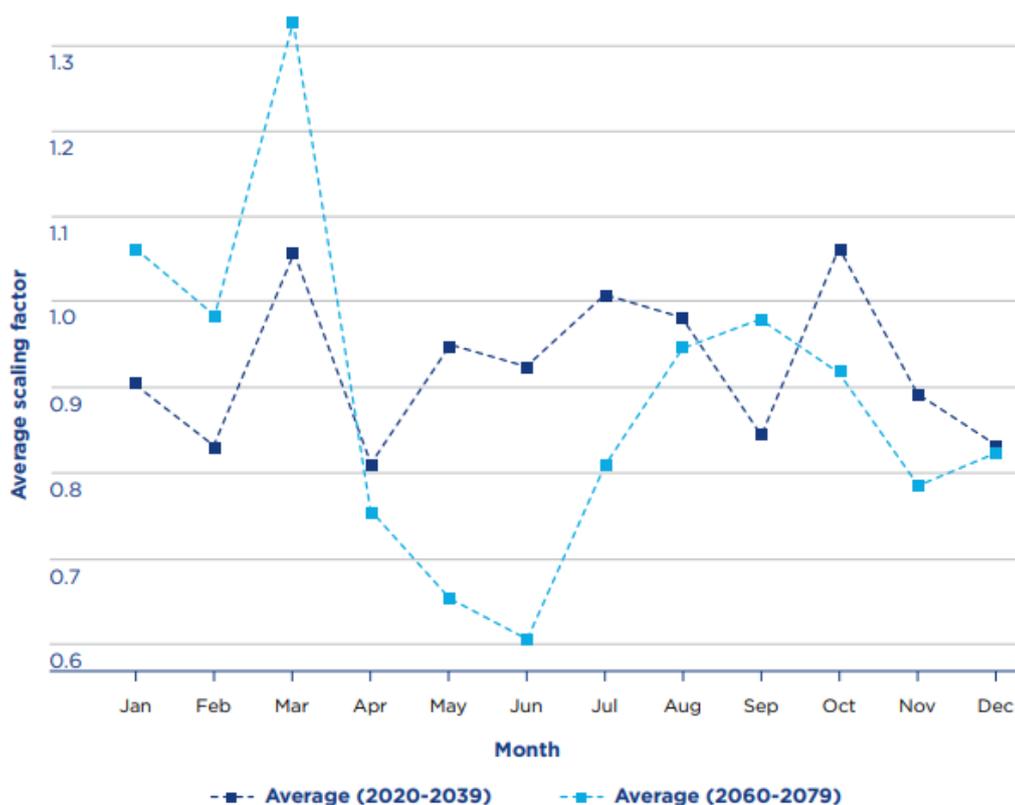
## Climate Change

Climate change is already impacting the environmental condition of the Macquarie valley, including the Schedule 8 water-dependent priority environmental assets it contains. The 2017-2020 drought was significantly worse than any other recorded. During this drought the Macquarie River was cut off at Warren, when the Warren weir was increased to secure critical human needs were met upstream - resulting in catastrophic conditions downstream.

The draft 2019 Macquarie-Castlereagh Regional Water Strategy (the RWS) includes summaries of the robust and extensive climate change impact modelling undertaken by the NSW Government and reviewed by the Office of the Chief Scientist. The RWS explains that the chances of droughts as severe as the 2017-2020 drought will increase as the impacts of climate change continue.

The Macquarie catchment is expected to see increased temperatures, an increased number of very hot days and increased evapotranspiration. The most significant predicted change will be to the seasonality of rainfall.

**Figure 8b. Average monthly change in rainfall for the Macquarie-Castlereagh region for the period 2020 to 2039 and 2060 to 2079 compared to the period 1990 to 2009 from NARClIM projections**



*Draft Macquarie-Castlereagh Regional Water Strategy Sept 2020 – page 39*

Combined, the predicted changes to climactic conditions in the Macquarie could in a worse case scenario see a reduction in inflows into Burrendong dam of 50% by 2070. The one thing we can confidently say about the impacts of climate change is that they have come on faster than scientists have predicted.

The draft RWS (page 44) states:

*“just relying on our historical data to make water management decisions no longer represents the best course of action”*

Inland Rivers Network considers that rules in WSPs must be changed to take into account the latest climate change predictions so that the environmental assets in the Macquarie catchment are prioritised and protected.

### **Alluvium Review**

The Audit of the Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012 from October 2019<sup>5</sup> found that the following provisions of the WSP were not being given effect to:

- Part 2 Vision, objectives, strategies and performance indicators, cl. 12 Performance indicators used to measure the success of the WSP strategies to reach the objective of the WSP
- Part 6 Limits to the availability of water, cl. 35 Compliance with the long-term average annual extraction limits for the Extraction Management Unit (EMU).

Several other provisions of the WSP were only partially given effect to.

Alluvium recommended that ‘NSW Government to ensure all roles and procedures are documented so that the provisions of the WSP are fully and consistently operationalised, implemented and there is accountability.’ IRN acknowledges that a ‘Water Planning Implementation Team’ was formed. However it isn’t clear that a commitment made in the government’s response to the ICAC report into Water Management in NSW that the team’s first report be published by June 2021 was fulfilled.

IRN is most concerned that the audit found there is a very high chance that compliance with the long-term average annual extraction limit will not be met.

### **Groundwater**

In 2020 the WSP was amended to remove four alluvium water sources:

- the Bell Alluvial Groundwater Source,
- Cudgegong Alluvial Groundwater Source,
- Talbragar Alluvial Groundwater Source and
- Upper Macquarie Alluvial Groundwater Source

These water sources were taken over by the *Water Sharing Plan for the Macquarie-Castlereagh Groundwater Sources 2020*. A replacement of the *Water Sharing Plan for the Macquarie-Castlereagh Groundwater Sources 2020* isn’t due until 2030/31.

IRN are concerned that independent audit or review by NRC of the water sharing rules and conditions over the above mentioned groundwater sources has not occurred. The 2019

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<sup>5</sup> [https://www.industry.nsw.gov.au/data/assets/pdf\\_file/0009/289485/Macquarie-Bogan-Unregulated-and-Alluvial-Water-Sources-2012.pdf](https://www.industry.nsw.gov.au/data/assets/pdf_file/0009/289485/Macquarie-Bogan-Unregulated-and-Alluvial-Water-Sources-2012.pdf)

Alluvium Audit was completed by an audit panel appointed by Minister Pavey. This process presumably “facilitated” the Ministerial Orders that separated groundwater plans from combined unregulated WSPs to form consolidated alluvial WSPs in a number of inland water resource plan areas including the Lachlan.

Our concerns about the condition of the groundwater sources include:

- In the Upper Macquarie Alluvial Groundwater Source, extraction exceeded permitted take by 22.3% in the 2019-2020 water year.
- A significant number of extreme and high risks were identified in the risk assessments for groundwater sources in the Macquarie valley developed for the draft Water Resource Plan.
- There is low compliance among groundwater users, with the Natural Resources Access Regulator finding in August 2021 that about one in ten groundwater users (NSW wide) are non-compliant.
- Between 2017–18 and 2019–20 reliance on groundwater rose from roughly 11% of the state’s overall metered water use to 27%.<sup>6</sup>

## Review Questions

### 1. To what extent do you feel the plan has contributed to environmental outcomes?

As compliance to the long-term average annual extraction limit (LTAAEL) is not assessed, the WSP has not contributed to environmental outcomes.

The volume of water taken from unregulated surface water was not able to be calculated because water use data in the unregulated rivers is not available due to a lack of broad scale metering in these water sources.

There is no way to determine if Planned Environmental Water (which is fully defined in the WSP) is protected from extraction if extraction is not assessed.

Recommendation: All water extraction is metered and monitored, including basic landholder rights and stock and domestic, enabling the compliance to the LTAAEL to be assessed.

Currently the way the WSP makes provisions for the flow regimes in the Macquarie-Castlereagh LTWP is through the of the LTAAEL, access trading rules and environmental water holdings.

IRN considers that the LTAAEL may not represent a sustainable level of extraction, rather that it is a representation of averaged historic use. Using long term flow data and taking averages without excluding large flood events creates a very high extraction limit that in most years, the river struggles to deliver.

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<sup>6</sup> NSW State of the Environment 2021 – EPA

That, coupled with the fact that extraction in the WSP water source area is not assessed for compliance to the LTAAEL means that the flow regimes in the LTWP are not protected from extraction.

Reliance on the LTAAEL that may not be environmentally sustainable, and is not complied to, is not adequate to protect the priority environmental and cultural assets of the Lower Macquarie, as it reflected in the risk assessment developed for the Water Resource Plan.

Recommendation: Specific rules be developed that protect the flow regimes in the Macquarie-Castlereagh Long-Term Watering Plan for the protection of the water-dependant priority environmental assets situated downstream of the regulated system.

IRN acknowledges that Active Management rules came into effect in December 2020 that provide for the protection of Held Environmental Water (HEW) in the unregulated Macquarie water sources. IRN member group Healthy Rivers Dubbo expressed concerns in 2020 about the modelling used by WaterNSW to forecast the presence and behaviour of active environmental water in the Lower Macquarie:

*“The use of long term averages isn’t a useful way to reflect the hydrology of the Marshes. The Department has stated in the consultation documents that “The volume of flow passing Miltara is estimated as usually less than 10% of the flows entering the marshes.” and has explained that averages were used to come up with that figure. The reality is, that when the Marshes are wet inflows approximately equal outflows – water coming into the system pushes an equal volume of water out. When the Marshes are parched, hundreds of GL of water are needed to prime the soils before any water can be metered at Miltara.”*

Recommendation: Using data based on long term averages is not a sound method of determining extraction limits, or the presence and behaviour of active environmental water in complex wetland environments. More nuanced, sophisticated methods should be investigated.

Part 8 Rules for manging access licences Division 2 under cl. 53 (8) that water must not be taken from the Lower Nyngan Weir Pool when the water level in the Weir is at or below 50% of full capacity cannot take effect until the Lower Nyngan Weir Poll is surveyed.

Recommendation: The Lower Nyngan Weir Pool be surveyed to determine the level that represents 50% of the full capacity.

## **2. To what extent do you feel the plan has contributed to social outcomes?**

The WSP fails to meet the objective to “protect, preserve, maintain and enhance the Aboriginal, cultural and heritage values of this water source”

Recommendation: WSP reviews align with Closing the Gap commitments including providing access to water to achieve social, cultural and economic outcomes for First Nations People.

The WSP does allow provisions for access to water for basic landholder rights and stock and domestic rights. However IRN considers that there are no provision given to keeping water quality within target ranges for basic landholder rights. To maximise the ecosystem services provided by healthy riparian zones and reed beds, the use of riparian zones in the upper catchment should be reviewed.

Recommendation: Grazing guidelines (similar to those that are followed by the Gwydir Wetlands and Macquarie Marshes grazing industries) be instituted for riparian grazing industries higher in the catchment.

### **3. To what extent do you feel the plan has contributed to economic outcomes?**

Compared with the regulated Macquarie water source, irrigation activities in the unregulated water source are varied and small scale. Four of the thirty unregulated water sources are classified as being of high economic significance:

- Fish River
- Macquarie River above Burrendong
- Molong Creek
- Queen Charlottes Vale Evans Plains Creek

By not being an effective tool for enforcing the LTAAEL, the WSP in effect offers no limits to economic activity created by water extraction. High levels of extraction being possible leads to environmental degradation and a reduction in the environmental values of the riverine systems.

When natural systems are not protected from over extraction, other economic activity that relies on the natural environment, like tourism and recreation fishing is impacted negatively.

With no effective way of ensuring the LTAAEL is enforced, irrigators higher in the catchments having first access to flows could extract more water than they are entitled to and deny irrigators downstream their fair share. A system where compliance to the LTAAEL is not enforced is open to abuse for economic gain.

### **4. To what extent do you feel the plan has contributed to meeting its objectives?**

*The vision for this Plan is to provide for the following—*

*(a) the health and enhancement of these water sources and their water-dependent ecosystems,*

The WSP does not enhance the health of the water source and water dependent ecosystems as compliance to the LTAAEL is not assessed.

The WSP did not protect the health of the water source and water dependent ecosystems from uncapped expansion of floodplain harvesting diversions.

*(b) the continuing productive extraction of surface water for economic benefit,*

By not ensuring compliance to the LTAAEL and not stopping the development of floodplain harvesting, the WSP is not an effective tool to ensure the fair distribution of economic benefit in the water sources.

*(c) the spiritual, social, customary and economic benefits of surface water to Aboriginal communities,*

The provision for water associated with Aboriginal cultural values and uses and native title rights has not been met.

*(d) the social and cultural benefits to urban and rural communities that result from surface water.*

The WSP does provide for basic landholder rights, stock and domestic and town water access to water.

#### **5. What changes do you feel are needed to the water sharing plan to improve outcomes?**

- A legal review of all water sharing plans that enforce compliance to the LTAAEL or stop water sharing activities until such time as the limits are transparently complied with.
- Include a rule to protect first flush flows after a prolonged drought from all types of access including supplementary and floodplain harvesting.
- Specific rules that ensure flows required to meet the requirements of the Long-term Watering Plan are protected from extraction.
- A schedule of First Nations cultural values should be included in the WSP.
- A legal review of all water sharing plans to ensure that the environment and First Nations cultural values are protected in light of the climate change predictions presented in the various Regional Water Strategies.
- A formal listing of the number and location of stock and domestic water use. All stock and domestic water use be metered.

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