Healthy Rivers Dubbo

Dubbo NSW 2830

heathyriversdubbo@gmail.com

Cate Faerhmann
Chairperson
Portfolio Committee No 7
Parliament House
Macquarie St Sydney NSW 2000

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Submission: Inquiry into the rationale for, and impacts of, new dams and other water infrastructure in NSW

Healthy Rivers Dubbo (HRD) is a grass roots community group dedicated to providing a strong voice for our local rivers, aquifers and wetlands in the Murray-Darling Basin for the benefit of wildlife, plants and people. We pay our respects to Elders past, present and future, and acknowledge that this land was never ceded.

HRD is grateful for the opportunity to submit to this inquiry into the impact of new dam projects in NSW. This submission will refer to all 5 projects that are the subject of this Inquiry, but will provide more detail about the Macquarie River re-regulating dam project.

Background

In a rush of political promises in an election year, over one billion dollars of public money has been committed to new dam and weir projects in NSW. The NSW Government seems to be forging ahead with the planning of these projects, and there is no transparency about the decision making process.

Dams are last century technology. Despite the populist messaging of the NSW National Party, it has been shown that dams actually create water shortages as they encourage extraction. In the last 20 years more than 1,100 dams have been removed in the United States of America, and in Europe a collective called Dam Removal Europe has removed 4,984 dams in recent years.

In their final report published in November 2000, the World Commission on Dams summarised:

- Dams fundamentally alter rivers and the use of a natural resource, frequently entailing a reallocation of benefits from local riparian users to new groups of beneficiaries at a regional or national level.
- In too many cases an unacceptable and often unnecessary price has been paid to secure those benefits, especially in social and environmental terms, by people

displaced, by communities downstream, by taxpayers and by the natural environment.

- Lack of equity in the distribution of benefits has called into question the value of many dams in meeting water and energy development needs when compared with the alternatives.

Water security issues experienced in NSW in the recent unprecedented drought cannot be solved by the 5 projects that are the subject of this inquiry.

Term of Reference

(a) the need for the projects, including the historical allocation of water and consideration of other options for ensuring water security in inland regions,

The new dam projects, Raising Wyangala Dam Wall, Macquarie Re-regulator, Dungowan Dam and Mole River Dam are National Party election promises. There is no demonstrated need for these projects.

The Wyangala, Dungowan and Mole River projects are being unnecessarily fast tracked under the Water Supply (Critical Needs) Act 2019 which was rushed through NSW Parliament last November. This legislation is no longer relevant because all critical needs in NSW are now being met since rainfall events commenced in February 2020 and the state is now entering a period of above average rainfall. All storages in NSW are now at a level to supply critical human needs and water allocations for all categories of water license.

The NSW Water Supply (Critical Needs) Act should be repealed.

A key recommendation of the NSW State Infrastructure Strategy 2018-2038 water strategy is to develop Regional Water Strategies. These have not been completed or released for public comment. Another justification for the projects is that they are in line with recommendations in the WaterNSW's 20 Year Infrastructure Options Study. This study was developed with little or no public consultation. It is a very high level document, little more than a colourful brochure. It is far from a feasibility study.

The first detailed information on the five projects available to the public appeared in WaterNSW referrals under the Federal Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) in May 2020.

The scoping reports lodged under the referrals state that the projects are aligned with the NSW Government's 20 year infrastructure investment plan set out in the State Infrastructure Strategy 2018-2038, and the WaterNSW 20-year Infrastructure Options Study 2018. The key purpose of the Macquarie River, Dungowan, Mole River and Wyangala projects is to improve reliability of supply to general security water licenses. This purpose was reiterated in the referral documents under the EPBC Act.

WaterNSW, as a state corporation, has a conflict of interest in advocating for additional water to sell to their general security customer base, at the expense of water now available to the environment and end of system basic rights.

Mole River Dam:

The WaterNSW scoping report lodged with the referral to the Federal environment agency claims the proposal will offset high evaporation rates in on-farm storages and provide more certainty. More efficient management of on-farm storage and water demand would be a better solution.

Dungowan:

There has been no demonstrated need for the enlargement of Dungowan Dam by the proposed 22.5 GL (billion litres). This will not provide long-term water security for Tamworth under climate change predictions. Previous feasibility studies for the dam found it was too expensive.

The new Dungowan Dam is unlikely to benefit Tamworth because there is uncertainty around the retention of the 6 GL in the existing dam and 5 GL has been promised to irrigators. This leaves 11 GL at a cost of $44,000 per ML for construction.

Increasing the size of Dungowan will not make a difference to drought security under current water allocation rules in the Peel River water sharing plans

The funding available for the dam ($484m) could cover costs of a water recycling scheme, water tanks for each building, storm water harvesting for Tamworth.

Wyangala:

There is no justification for this project other than to improve water security for general security licence holders in the Lachlan Valley by an estimated 21.5 GL per year. This will increase water extraction by one set of users while impacting on water availability to the end of the system.

The raising of the dam wall will not improve water security in the Lachlan under the current water allocation rules. The main outcome of the project is more water for WaterNSW to sell to general security customers. The capture of an additional 650 GL of inflows to the Lachlan River will cause a decrease in water available to Lake Cargelligo, downstream stock & domestic users, basic rights and to the environment. This will cause a decrease in regional water security, particularly at the end of the Lachlan system.

Western Weirs Project:

There is a need to assess all of the structures on the Barwon and Darling-Baaka Rivers collectively. This project is an opportunity to identify obsolete structures that are blockages to fish passage and the free flow of the river, and remove them. Instead of replacing or restoring weirs that are for town water supplies, town water supplies would be better provided by off river storages than by replacing weir structures incorporating fish passage.

The cost of a 640 Megalitre off river storage would be less than half a million dollars. The cost of replacing a weir with fish passage could be up to $9 million. To reduce evaporation there are commercial products such as Floating Pond Cover Products[1] available.

Macquarie River re-regulating dam – justification:

The Macquarie River re-regulating dam will only hold general security licences. The objectives of the project as listed on the projects' WaterNSW webpage are:

- Achieving improved long-term water security strategic objectives in the Macquarie Valley
- Improved delivery efficiency to customers downstream of Gin Gin
- Reduced transmission losses when transferring and delivering water through the river system on an annual basis; and
- Maximise available water for general security customers within the sustainable diversion limits set under the Murray-Darling Basin Plan.

WaterNSW and the NSW Government claim the project will only capture 'rain cancelled' irrigation orders and re-regulate them for later release.

This project will increase the long term annual average general security availability by about 14 GL a year, according to a WaterNSW consultant talking at a small public gathering at Gin Gin on 7/9/2020. This is a relatively small volume when compared to the volumes typically extracted in a year by general security customers in the regulated Macquarie River source. In the two years to 30/6/2019, 450 GL was extracted by general security irrigation customers.

It is however, a very important volume for the environment to receive. There is no end of system target for the regulated Macquarie River, making rain cancelled orders a very critical element of the limited volumes of planned environmental water that flows below Marebone in a typical drier year. Documents presented to stakeholders and posted on twitter show a significant modelled reduction of low to small flushes and flows of up to 6.2% at Marebone.[2]

If the project is being built just to capture rain fall rejected orders, it is an exorbitantly expensive project to capture such a relatively small amount of water from the consumptive perspective.

Although WaterNSW and the NSW Government deny that they will catch tributary inflows from the Bell, Little and Talbragar Rivers, their documentation suggests otherwise, as discussed in detail below.

Macquarie River re-regulating dam WaterNSW campaign:

The community was told in community consultations (hosted by GHD and WaterNSW) in November 2019 that the licenced environmental water holders supported the project, as their accounts will have more water in them. As there will be an overall reduction in the

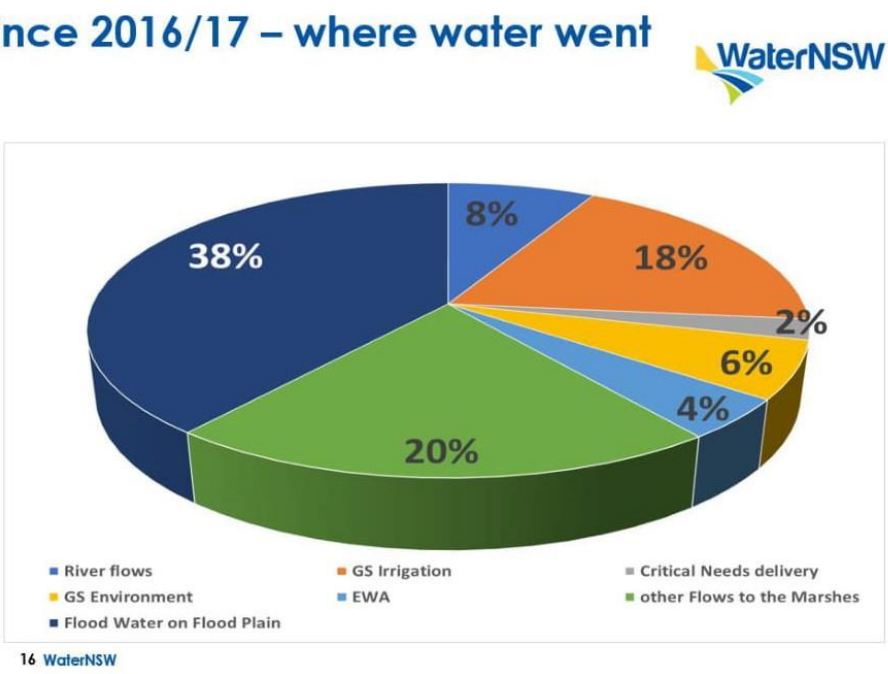
[1] https://www.awtti.com/floating-cover/
[2] https://twitter.com/FullCostRecover/status/1286279477811507205

volumes of water leaving the regulated section of the Macquarie, the net impact to the environment will be significantly negative. It has since been confirmed that the Commonwealth Environmental Water Holders' Office, NSW DPIE EES, nor NSW Fisheries have never publically endorsed the project. We were lied to.

At another public consultation in November 2019, the public were told that the project would be good for the Macquarie Marshes, because they get too much water and the roots of the plants rot. This is a direct lie that feeds into the narrative in this valley about the Marshes getting 'too much water'.

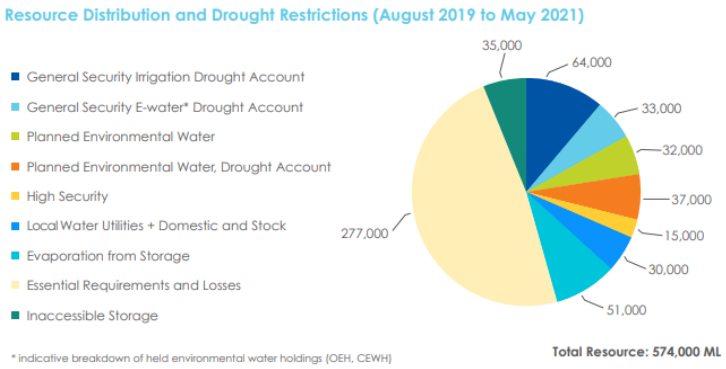
There has been a long running and toxic campaign in the Macquarie Valley to paint the picture that the Macquarie Marshes gets too much water, perpetrated and perpetuated by vested interests upstream. WaterNSW take advantage of this biased campaign when it suits them.

Earlier in 2020, Adrian Langdon from WaterNSW presented the following graph to the public at a drought update hosted by Dubbo Regional Council.



It appears the 20% shown here as 'other flows to the Marshes' is actually essential requirements. Essential requirements is the water used to deliver orders.

For reference, this pie graph shows a typical proportion of the water resource that is considered essential requirements.



WaterNSW are very proud of how tightly they operate the regulated section of the Macquarie River, reducing the volumes used to deliver orders to under 3% of delivered volumes.[3] It is extremely unlikely that over a whole year any essential requirements water reached the Macquarie Marshes.

WaterNSW representing essential requirements on a graph as 'other flows to the Marshes' is **outrageous** and **misleading**.

Technically, essential requirements are classed as a type of Planned Environmental Water (PEW). When the NSW Government and WaterNSW are trying to present the message to the public that irrigation only takes a certain % of water from a river system (17% in the case of the Macquarie), they are very happy to imply that all water that isn't taken for irrigation goes to the environment.

The Mayor of Narromine Craig Davis and Dugald Saunders MP Member for Dubbo are among those who publically perpetuate the myth that 17% of flows on the Macquarie go to irrigation, and 80% goes to the environment. This assertion is harmful and factually incorrect. According to their own graph "Where Water Went", 10% was managed for the environment including the Macquarie Marshes.

When it comes to justifying the Macquarie River re-regulating storage however, the NSW government, WaterNSW and even the Mayor of Narromine and Member for Dubbo are strong in their assertion that operational surpluses belong to the consumptive pool, and need to be physically recaptured and re-regulated.

The 38% 'Flood Water on Floodplain' includes vast unmeasured and undeclared volumes of water that is diverted with levies for free into private storage – or floodplain harvesting. Healthy Rivers Dubbo estimates from the limited available information that the volume of floodplain harvesting take in the Macquarie in 2020 at somewhere between 90 and 130 GL.

[3] https://www.waternsw.com.au/__data/assets/pdf_file/0019/145261/Macquarie-Operations-Plan-June-2019.pdf

This graph led to a member of the public writing a letter to the editor of a local paper claiming that 78% of water released from Burrendong dam from 2016- 2019 was for the environment. In truth, only 26% was released and managed for the environment.

Water Management Rules in the Macquarie Valley:

By changing some rules and conditions in the policy settings, water sharing plan (WSP) rules and protocols in the Macquarie Valley, water security in the valley could be improved without the need for the re-regulating dam to be built.

a) The Macquarie is a 'credit river', where water is allocated that is not physically in Burrendong dam, but only forecast to be.[4] Allocating water that is physically in the dam would reduce the risk of the Macquarie River flows ceasing as they did at Warren in 2019/2020 water year.

b) An amendment to WSPs in 2014 capped the drought of record data that can be used to calculate the available Water Determinations (AWD) in NSW to before the commencement of the WSP. In the Macquarie Valley's case, that is 2003. Because of this rule, AWDs in the future cannot take into account rainfall and inflow data from the recent unprecedented crippling drought of 2017-2019. This rule change has shifted the priority for providing security and reliability to general security license allocations thus threatening town water supply and critical human needs.

c) There is a protocol in place in the Macquarie Valley that would allow WaterNSW to debit customer's accounts by the volume of water they order, as opposed to the volume that they pump, however this protocol has not been used.[5] Debiting customer orders by the volumes ordered would discourage over ordering, meaning WaterNSW would not take a financial hit when customers over order, and negate the need to construct an expensive structure.

Historical Allocation in the Macquarie Valley

When Burrendong dam was completed in 1966/67 the yield of the Macquarie River was assessed as 406 Gigalitres (GL – a billion litres). The total allocation of regulated and supplementary flow water for the system is now 899 GL[6]. The NSW 2014 State Infrastructure Strategy Update on page 89 explains that the size of the irrigation industry exceeds the yield capacity of the Valley.

To address over allocation, the NSW Government proposed the re-regulating dam, instead of addressing the obvious issue of over-allocation.

[4] The human dimension of water availability: Influence of management rules on water supply for irrigated agriculture and the environment Celine M.M. Steinfeld Ashish Sharma Raj Mehrotra Richard T.Kingsford
[5] https://www.waternsw.com.au/__data/assets/pdf_file/0006/122685/Water-order-debiting_rev3.pdf
[6] Johnson W J (2005) Adaptive management of a complex social ecological system: the regulated Macquarie River in south-eastern Australia. Master of Resource Science Thesis, University of New England.

Planned Environmental Water (PEW) in the Macquarie Valley

In the project's EPBC referral (page 6) WaterNSW says "Environmental watering flows to the Macquarie Marshes will be unaffected by the operation of the project" – this is a narrow and misleading definition of environmental water, which should include all forms of free flowing un regulated water in the river. By labelling some types of environmental water 'transmission losses' and 'inefficiencies', WaterNSW propose to turn planned environmental water into consumptive water.

Any increase in general security reliability must be a reduction of planned environmental water. Under the objectives of the Murray Darling Basin Plan there can be no net reduction in PEW.

The projects objectives are to capture and re-regulate 'operational surpluses' as general security, so the water can be used to meet customer orders. 'Operational surpluses' are PEW as defined in the NSW Water Management Act 2000 (c. water that is not committed after the commitments to basic landholder rights and for sharing and extraction under any other rights have been met.), and the Commonwealth Water Act 2007.

The Macquarie Castlereagh regulated water sharing plan doesn't include the entire definition of PEW that is in the Water Management Act. Consistency in the definition of PEW across the whole Basin is needed.

The proponents of the project claim that tributary inflows from below Burrendong dam will not be captured by the project, however the definition of 'operational surpluses' as given on page 16 of the scoping report identifies 'useful tributary contributory inflows' as part of that definition.

WaterNSW have not published the volumes of tributary inflows that enter the Macquarie River from below Burrendong dam that are used to meet customer orders. This definition of operational surplus will give WaterNSW a blank cheque for capturing tributary inflows and regulating them as general security.

General security licenses have the lowest priority under the NSW *Water Management Act 2000* (WMA). Environment, basic rights and town water supply have a higher legal priority. These higher priorities, especially planned environmental water and basic rights, will be impacted by the project through the capture of water that currently flows downstream.

The hierarchy of the WMA is being ignored by WaterNSW and by the State infrastructure strategy.

(b) The economic rationale and business case of each of the projects, including funding, projected revenue, and the allocation and pricing of water from the projects,

In October 2019 a joint announcement was made by the Prime Minister and NSW Premier to invest over $1b of public money in new dam projects in NSW. There is no economic rationale provided to invest over $1b of public funding in new and enlarged instream water storages in inland NSW.

The key purpose of the main projects, as outlined in the WaterNSW scoping reports, is generally to provide increased water security for general security water licences. Under current water planning rules this will be at the expense of town water supply, high security licenses, stock & domestic licenses, basic rights and planned environmental water.

Mole River:

The business case for the Mole River Dam proposal is under development at the same time as survey work is undertaken for the Environmental Impact Statement. The Jacobs Report commissioned by WaterNSW in 2017 found the Mole River Dam to be financially unviable. There has been no consultation or transparency around decisions made to invest public money in this project.

There has been no WaterNSW public engagement or consultation on this project.

There is no disclosure about the ongoing funding for the management and maintenance of the project. The NSW Government takes a user pays approach through the Independent Pricing and Regulatory Tribunal for WaterNSW budget allocations. There has been no consultation about impacts on water charges and pricing for water license holders.

The proposal will not be suppling town water to Tenterfield or to upstream agricultural enterprises. The beneficiaries of the investment are likely to be a small number of licence holders in the regulated Border Rivers.

A business case for this proposal, including the costs and beneficiaries, should be publicly available before any further planning activity is undertaken.

Dungowan:

While the purpose of the Dungowan Dam is primarily to supply Tamworth town water, there has been a provision to guarantee 5 GL/yr to general security licenses. This will impact on the reliability for Tamworth water supply.

A full business case will not be completed until June 2021 and will not be fully disclosed to the public. The environmental assessment is being conducted at the same time. There is a lack of transparency and poor consultation in regard to investment of public money on a project that is likely to fail to meet its purpose.

There is confusion over who will own and operate the dam between WaterNSW and Tamworth Regional Council.

It is assumed that general security license holders will have increased annual costs to cover improved water security. Tamworth ratepayers have already had a price hike to pay for the augmentation of Chaffey Dam in 2016 that failed to improve security of town water supply. Tamworth ratepayers have already been charged for the augmentation of Chaffey Dam.

There is no information regarding the inclusion of fish passage and mitigation of cold water pollution within project costings.

Wyangala:

No business case has been provided for the raising of Wyangala Dam wall by 10m while the Water Minister has directed WaterNSW in June 2020 to advance planning and early works for the project. Wyangala Dam, at 1,217 GL capacity, is already one of the largest water storages in NSW. A 53% increase in storage capacity has not been economically justified.

$650m of public money has been announced for the project. There has been no transparency around the decision-making for this funding announcement. There is no disclosure about the ongoing funding for the management and maintenance of the project.

The justification for investing $1m per Gigalitre increase in storage has not been made. The return on this public investment is unclear. The cost per Megalitre of increased water security by 21.5 GL/year is approx. $30,200 for general security licence holders.

The rationale is a Federal Government policy to increase agricultural production. However, this is reliant entirely on rainfall and inflows to the storage.

When questioned in the Senate, Phillip Glyde pointed out that any extra water captured by new dam projects would have to be sourced from the market:

> *Senator HANSON-YOUNG: Mr Glyde, if there is a commitment to stay within the sustainable diversion limits—and that is a legal requirement, is it not?*
> *Mr Glyde: That's correct.*
> *Senator HANSON-YOUNG: Who is going to be offsetting what is in there, or are there going to have to be changes to make sure that people downstream still have access to the water that is captured and stored?*
> *Mr Glyde: The proponent of the dam that you're talking about would be the entity that would have to acquire that water from within the market. Where that would come from, given water trade and things like that, is almost impossible to tell.*[7]

[7] https://www.aph.gov.au/Parliamentary_Business/Hansard/Hansard_Display?bid=committees/estimate/6ec597c8-3fd7-443b-a0e3-1ba2db1bea1a/&sid=0000

Western Weirs Project:

Tourism including recreational fishing is a critical industry for the Barwon and Darling-Baaka Rivers. Weir pools encourage carp and blue green algae. Native fish need to have flowing rivers to thrive, feed, breed and migrate. In less than 100 years there has been a reduction of native fish populations by about 90%, due largely to blockages to fish passages and the other impacts of weirs and dams.

The Western Weirs project provides the opportunity of restoring reaches of the river system so there are more sections that are not artificial pools.

Macquarie River re-regulating dam:

Modelled figures of the expected long term increase in general security availability have been presented to some stakeholders, with instructions not to distribute. The figures are not available to the public, and are critical for the public's understanding of the project.

The Member for Dubbo Dugald Saunders MP stated on the John Laws Show 21/7/2020[8] that the project would mean "not one drop of water extra that goes to irrigation."

The public deserved to know exactly how much extra water will be available for general security entitlements through increased reliability.

The projected cost of the project has not been made public, although we do know it will cost over $30,000,000 as it is a state significant infrastructure project. Minister Pavey has said in response to questions in parliament that the costs will be in the business case.[9]

The Member for Dubbo Dugald Saunders MP has said emphatically in public on the John Laws Show 21/7/2020[10] that the business case would be made public. WaterNSW have said that despite the Member for Dubbo's public promise, there is a good chance the business case will not be made public.[11] The public has a right to know the expected cost of the project, we would like to see the business case.

No indication of projected revenue or return on public investment has been released.

The State significant infrastructure development application for the Macquarie River Reregulating storage project should be cancelled.

[8] https://healthyriversdubbo.com/2020/07/26/dugald-saunders-confirms-height-of-new-dam-on-the-macquarie-its-a-whopper/
[9] https://www.parliament.nsw.gov.au/lc/papers/pages/qanda-tracking-details.aspx?pk=246965
[10] ibid
[11] https://twitter.com/melissagray19/status/1301388863928020992

(c) The environmental, cultural, social and economic impacts of the projects, including their impact on any national or state water agreements, or international environmental obligations,

The significant environmental impacts of these projects on river systems cannot be offset or mitigated.

These cumulative downstream impacts of withholding a combined volume of 770 GL will not be adequately assessed under the process established to assess and approve the projects on an individual basis.

The preliminary assessments of all the proposed projects have indicated an impact on the endangered Murray Cod through loss of breeding habitat, loss of beneficial flow regimes and further loss of fish passage. Other endangered native fish species identified to be impacted by the dam proposals include critically endangered Silver Perch and endangered Macquarie Perch, also the Purple Spotted Gudgeon, Western Olive Perchlet and Eel-tailed Catfish.

The Murray Cod has suffered significant population decline in the NSW Murray-Darling Basin due to poor water management during the most recent intensive drought. The cost of saving depleted populations through relocation and captured breeding programs will be a waste of money and effort if natural habitat continues to be destroyed through additional large instream structures.

<u>Mole River:</u>

The proposal will disturb 829 ha through inundation and construction activities, 778 ha with native vegetation, including critically endangered Box Gum Woodland and endangered Semi-evergreen vine thicket. Preliminary assessment found 15 impacted threatened plant species and 17 threatened animals.

There will be a significant impact on threatened fish species: the nationally vulnerable Murray Cod and threatened Purple Spotted Gudgeon, Western Olive Perchlet and Eel Tailed Catfish. Fish populations will lose upstream and downstream movement to breeding and feeding sites, dividing and isolating populations above and below the dam wall. This impact cannot be mitigated.

Changes in river flow and hydrology will impact on river health. There is a high likelihood of blue-green algal blooms within the storage and of cold water pollution downstream.

The Mole River has high environmental diversity and is recognised as a high ecological value aquatic ecosystem under the Murray-Darling Basin Plan. The regulation of the river through construction of an instream dam will degrade the environmental values of the river.

The Mole River region is country of the Ngarabal and Jukambal First Nations people. The area is highly likely to contain significant cultural heritage values such as scar trees and other indications of First Nations economic activity near the water source. Cultural and spiritual associations with water and connections to country are highly valued by First Nations people.

Limited archaeological survey work has been conducted in the impact area. Social fabric of a remote rural community will be impacted through the loss of farming land, loss of neighbours and disruption of local community and family networks. Loss of amenity, well-being and recreational activities such as fishing and camping on a natural river with high environmental diversity.

Loss of highly productive grazing land, river flats and farming and tourism enterprises in the inundation area and downstream, changes to water licenses and charges, water access rules and water pricing is not being assessed in the planning process.

Dungowan:

The dam will impact on health of Peel River system – habitat for threatened native fish species listed for protection under Federal environmental law (EPBC Act) - the critically endangered Silver Perch and vulnerable Murray Cod. Further loss of fish passage will hinder population movements up and downstream.

Other water dependent species that will be significantly impacted include platypus, turtles, blackfish and water birds.

The capture of additional natural flows will further degrade river ecosystem function – temperature, oxygenation, nutrient transfer, macroinvertebrate food sources. Loss of connectivity to the floodplain through increased water capture has a compounding environmental impact.

Natural Resources Commission report on Peel River water sharing plan notes that the proposed replacement of Dungowan Dam with a larger storage will have an impact on inflows to the Peel River and the environment.

An area of critically endangered Box Gum Woodland will be lost in the inundation and construction area. This ecological community supports a range of threatened woodland bird and animal species.

The dam footprint is in Kamileroi First nations country with associations with the Nganyaywana language group to the north, Birpai language to the east and Geawegal language to the south. Waterways are generally places with high cultural values for First Nations people.

Loss of natural flows to Dungowan Creek and Peel River will have social impacts through loss of amenity, impacts on basic rights and changes to water availability in connected downstream rivers in Namoi and Barwon-Darling catchments. The loss of flows in downstream rivers has cumulative social impact on townships, health & well-being, recreational opportunities and causes prolonged drought.

The capture of an additional 22.5 GL from Dungowan Creek inflows will impact on water sharing arrangements and rules in the Peel River Regulated water sharing plan.

The Namoi River is highly connected to the Barwon-Darling River. Namoi inflows are part of the development of the Murray-Darling Basin Plan sustainable diversion limits. Increased impoundment of water in the upper catchment will decrease the volume available downstream. The purpose of the Basin Plan is to recover water to repair degraded river systems. Dams and instream structures are one of the key causes of loss of river health in the Basin.

Wyangala:

The project will have significant environmental impacts within the increased inundation zone and on downstream aquatic ecosystems, wetlands of national importance and habitat for migratory birds listed under international agreements through loss of natural flood flows.

Impacted species listed as threatened under the Federal EPBC Act include the critically endangered Silver Perch, endangered Macquarie Perch and vulnerable Murray Cod, 1,391 ha the critically endangered Box Gum Woodland ecological community and other listed species dependent on this woodland habitat.

Mt Davies Nature Reserve will be impacted by higher water levels.

Wyangala Dam has a significant cold water pollution impact. Public money would be best invested in a variable offtake installed in the existing structure.

Significant First Nations cultural values, including burial sites will be impacted within the inundation area. Connection to Country and a healthy river system are important cultural values that will be impacted. Cultural water entitlements have not been allocated in the Lachlan system.

Fast-tracking the displacement of the Wyangala Dam recreation areas is having a significant social impact. Also potential loss of access for neighbouring property owners and communities through the proposed increased inundation area is a significant social impact.

Loss of flows and water availability to downstream water users, especially end of system basic rights users, will have major social and health impacts.

The loss of flood flows to downstream communities will cause increased economic hardship, loss of recreational opportunities and decreased productivity. The capture of an additional 650GL of inflows to the Lachlan River will prolong drought conditions for the mid to end-of-system communities.

Western Weirs Project:

Flowing habitat is most needed by native fish. Weir pools are ideal for carp and blue-green algae. Alternating wetting and drying of low sides of the channel between natural pools also enhances productivity for the aquatic food chain including fish – that only happens at the top end of a weir pool, not much on the sides.

Macquarie River re-regulating dam:

WaterNSW have shown that they are not responsible environmental asset managers.

Currently there are fish passage infrastructures on WaterNSW assets in the Macquarie valley that are in need of maintenance, including the South Dubbo rock fishway that has sapling trees growing in it and the Warren weir vertical slot fishway which is clogged up with sticks and debris.

WaterNSW have had a legal obligation to construct 11 fishways in NSW as dam safety upgrade project offsets for up to ten years. One of the sites owed a fishway is Gin Gin, the site of the planned Macquarie River re-regulating dam. There has been no acceptable explanation as to why these fishways were not funded in the 2014 IPART determination period.

WaterNSW have already designed a fishway to be built on the current Gin Gin weir at its current working level, they will not publically release these plans. They claim the cost of replacing the Gin Gin weir at its current height with a fishway would cost the same as the new re-regulating structure. The public does not know the cost of either project.

The project will inundate a registered Aboriginal Heritage site. The project's Scoping Report states "The nature of the recorded sites suggests that similar sites are likely to exist at other locations along the River and across the landscape." This flippant attitude has caused offence to the First Nations and broader communities in the Wambuul-Macquarie Valley.

There has been no assessment of the socio-economic impact that reducing low flows and freshes by up to 6.2% u/s of Marebone weir[12] would have on businesses and communities downstream. Grazing, recreational fishing, tourism and unregulated irrigation are some of the economic activities downstream of the project that will be impacted by reduced flows.

This dam will be able to redirect planned environmental and unregulated water from the Little, Bell and Talbragar Rivers for irrigation. These unregulated and natural flows currently provide the majority of the remaining critical natural flows in the Macquarie. Natural tributary and unregulated flows are critical for many ecological processes and the organisms that rely on them. They are essential flooding regimes which support some of Australia's most important wetland areas for biodiversity.

In the Scoping Report [13]and EPBC referral[14], WaterNSW state that some of the largest scale waterbird breeding events ever recorded in Australia have occurred in the Macquarie Marshes have been assisted by targeted delivery of water for the environment. This scientifically misleading implication ignores the published science which clearly

[12] https://twitter.com/FullCostRecover/status/1286279477811507205
[13] https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=PDA-1315%2120200303T024253.055%20GMT
[14] https://healthyriversdubbo.com/2020/09/03/a-sobering-read-epbc-referral-for-the-macquarie-river-re-regulating-dam/

demonstrates that it is the natural free flowing unregulated flows that triggers waterbird to breed.[15]

Managed water for the environment is important to maintain habitat in the Ramsar wetlands, but it cannot recreate the natural conditions required to trigger colonial waterbird breeding events. Unregulated tributary flows that are likely to be affected by the project are the most important for the breeding of water birds. The Macquarie Marshes are one of the most important sites for waterbirds in Australia.

It is critical to maximise the volume of uncontrolled flows that reach the Macquarie Marshes to ensure they can facilitate breeding for migratory birds, which marks the area as an internationally significant Ramsar listed wetland. The project is expected to have significant impact on the habitat of 14 species of migratory birds 10 colonial-nesting species, and a total of 233 native species of birds including 77 species of waterbird, some of which are listed as critically endangered.

The Marshes also provide habitat for 60 native reptile species, 11 species of native fish, 29 native mammals, 15 native frogs and 324 native plant species.

Natural flows are the right temperature, they collect carbon from the river banks to kick start the food web, and they coincide with environmental triggers that native wildlife and vegetation respond to. Tributary flows provide the natural variability and quality of water that determines the extent and quality of habitat for the many different species that depend on the Ramsar listed wetlands.

Australia has legal responsibilities under the Commonwealth Water Act 2007, the Ramsar Convention, other international migratory bird agreements and the Murray Darling Basin Plan to ensure the character of Ramsar listed wetland is protected. The Macquarie Marshes are a key environmental asset of the Murray-Darling Basin.

In 2010 the Australian Government issued a formal notification of a likely "change of ecological character of the Macquarie Marshes Ramsar site" to the Ramsar Secretariat.

The conditions of the Macquarie Marshes Ramsar site remains poor because of the ongoing effects of regulation. This project will exacerbate ongoing decline in all of the elements outlined in the 2010 notification to Ramsar.

The project will impact the habitat of Eel-tailed Catfish, Olive Perchlet, and Southern Purple Spotted Gudgeon, listed as threatened and endangered under the NSW Fisheries Management Act.

[15] https://www.ecosystem.unsw.edu.au/sites/default/files/2020-06/Kingsford_UNSW_Centre%20for%20Ecosystem%20Science_Macquarie_Reregulating%20Storage_Submission_EPBC%20Referral_2020_8652.pdf

As per the projects' EPBC referral, the project will have the following significant impact on the critically endangered Silver Perch, endangered Trout Cod and vulnerable Murray Cod under the EPBC Act:

- Loss of freshwater habitat types such as riffle zones due to inundation, and changes to flow regimes and water quality.
- Impacts to aquatic habitats and riparian vegetation from the regular variability of water levels within the storage and the associated effects on river bank stability.
- Loss or decrease of available recruitment area, due to changes in available habitat.
- Likely impacts to the structural elements that make up established habitat (of vulnerable Murray Cod) in the existing Gin Gin Weir pool, including potential spawning sites.
- The new operational regimes may impact larval recruitment and the movement of fish in the locality.
- Greater variability in the pool levels and altered fish passage opportunities at the location.
- Alterations to important fish habitat in this locality and the potential operation effects on habitat and spawning for Trout Cod and Murray Cod may give rise to potentially significant impacts to these species.

The project will affect the passage of nutrients and organisms that need to migrate up and down the river. The provision of a vertical slot fish ladder does not ameliorate this problem.

Native fish populations in the Macquarie River and Marshes are in extremely poor condition and are identified as an Endangered Ecological Community. Transforming the nature of the river from flowing to a still lake character will suit introduced pest species like European carp and Mosquito Fish.

This project will have a significant impact on the volumes of water available to connect the Macquarie River with the Barwon, especially in drier years. Connection between the Macquarie and Barwon rivers is critical for threatened fish populations.

The 30km weir pool the project will create will kill riparian vegetation such as river red gums, who cannot tolerate extended inundation that would occur during the irrigation system. Some of the individual river red gums that will be drowned because of this project are many centuries old. The loss of these trees cannot be mitigated by the planting of seedlings that will take hundreds of years to grow to the same size as the trees that are being sacrificed, if they make it at all.

(d) The impacts of climate change on inland waterways, including future projections, and the role of dams and other mass water storage projects in ensuring security of water supply for social, economic and environmental outcomes

In 2013 the NSW Government produced a draft report Assuring future urban water security which was never published. This report found Dubbo would have 26% less potable water available by 2030.[16]

A global study of rivers in 2018 concluded we can expect less water in rivers and dams even if rainfall increases with climate change, due to drier soils and reduced runoff.[17]

A report by Interim Inspector General, Mick Keelty found that inflows into the Murray had halved over the last 20 year period.[18]

The loss of rainfall runoff through climate change impacts will prevent the increased storages to meet full capacity over the predicted timeframe. The public investment will be a wasted opportunity with no returns other than ongoing degradation of river systems. Climate change predictions are for continuing higher temperatures, higher evaporation rates, and less rainfall runoff. This means that mass water storage projects will not ensure security of water supply for social and economic outcomes and will intensify the environmental degradation of river systems.

Current water management rules do not take existing droughts of record into account and do not provide for predicted increased extreme weather events caused by climate change in the future.

High temperatures cause higher evaporation rates from large dams and increased transmission losses. The failure of the augmented Chaffey Dam to secure Tamworth water supply, its prime purpose, demonstrates that dams are not the long-term solution to water security in a drying climate.

The current rules for allocation of water under the water sharing plans of the valleys where the four dams proposals are will cause any additional water to be allocated rather than remain in storage for future drought security.

(e) water infrastructure technologies that may promote enhanced environmental outcomes,

Town water supplies on the Barwon and Darling/Baaka rivers could be secured with off river storages, incorporating evaporation reduction technology.

More efficient irrigation technology will improve water security, especially if the flood irrigation of cotton was ceased.

[16] future urban water security document
[17] https://newsroom.unsw.edu.au/news/science-tech/long-dry-global-water-supplies-are-shrinking
[18] Interim Inspector General, March 2020. Impact of lower inflows under the Murray-Darling Basin Agreement

Demand management in urban water use through effluent recycling, storm water harvesting and water tanks for households will improve town water security.

Investment in a variable offtake in the existing Wyangala Dam will help to mitigate downstream cold water pollution.

Investment in fish passage on existing instream structures will enhance environmental outcomes.

(f) any other related matter.

The fast-tracking of the Wyangala Dam Wall Raising project and Dungowan dam project by commencing auxiliary works in October 2020 prior to the completion of the business case or EIS is highly unsatisfactory. These unapproved works could lead to a waste of public money and unnecessary environmental disturbance.

The Wyangala Dam Wall Raising project, the Macquarie River re-regulating dam, Mole River dam, and the Dungowan dam are not Critical State Significant Infrastructure. WaterNSW should cancel the development application submitted to the Department of Environment, Industry and Planning.

The Mole River Dam, Wyangala dam project and Dungowan dam project should be removed from the NSW Water Supply (Critical Needs) Act 2019, and that Act should be repealed.

Towns and localities on the Barwon-Darling listed under NSW Water Supply (Critical Needs) Act 2019, such as Walgett, Bourke and the Darling River between Bourke and its junction with the Murray River, will be further impacted if the Mole River Dam Project goes ahead and captures more flows from the highly connected NSW Border Rivers.

More conservative water allocations and improved water use efficiencies are a more cost effective method of securing water supply.

For further information please contact

Melissa Gray
Convenor
Healthy Rivers Dubbo

healthyriversdubbo@gmail.com