

Commonwealth Environmental Water Holder

Australian Government



# COMMONWEALTH ENVIRONMENTAL WATER HOLDER

# SUBMISSION TO NRC REVIEW OF THE LACHLAN, MACQUARIE-CUDGEGONG AND NAMOI WSPs

# Contents

Intro	oduction	.1
Ove	rarching issues	.2
2.1	Improved Protection of Environmental Water	.2
2.2	Climate change, variability and streamflow trends	.3
2.3	Connectivity	.4
2.4	Floodplain Harvesting	.4
2.5	Water Quality	.5
2.6	Reasonable use guidelines for basic landholder rights	.6
2.7	First Nations cultural values, uses and benefits	.6
2.8	Meaningful monitoring, evaluation and reporting	.6
Lach	nlan Regulated Water Sharing Plan 2016	.8
Mac	cquarie-Cudgegong Regulated Water Sharing Plan 2016	13
Namoi Regulated Water Sharing Plan17		
	Intro Ove 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 Lach Mac Nan	Introduction

# **1** Introduction

The Commonwealth Environmental Water Holder (CEWH) role is established by the Commonwealth *Water Act 2007* to manage Commonwealth water holdings for the purposes of protecting and restoring environmental assets of the Murray-Darling Basin and to give effect to relevant international agreements. This submission has an emphasis on water management to support environmental outcomes and assets, while acknowledging that a healthy river underpins the social, cultural, economic and environmental outcomes, both within each catchment and across the Basin. The CEWH acknowledges the important role of the Natural Resources Commission (NRC) in providing independent evidence-based advice towards the sustainable management of natural resources in NSW. The CEWH welcomes the opportunity to make a submission to the NRC's review of the Lachlan, Macquarie-Cudgegong and Namoi Regulated Water Sharing Plans (WSPs). The submission is primarily focused on environmental outcomes that can be influenced by water for the environment and raises a suite of overarching issues and recommendations, followed by discussion of matters that are specific to Lachlan, Macquarie or Namoi Regulated WSPs.

# **2** Overarching issues

# 2.1 Improved Protection of Environmental Water

#### 2.1.1 Planned Environmental Water

Under the Basin Plan, there are two types of environmental water – held environmental water (HEW) and non–entitlement water or planned environmental water (PEW). Both HEW and PEW are important to ecosystem resilience, for example in maintaining base flows and water quality.

The efficient and effective use of the Commonwealth water holdings are predicated on PEW being protected. The Basin Plan recognises this through its "no net reduction in protection of PEW" provision at section 10.28. This provision recognises that any changes that reduce the protection of PEW undermines the baseline of protection to river environments and the capacity of the CEWH to support targeted environmental outcomes in each of these water sources.

Ensuring WSP rules maintain the protection of PEW, including protecting it from subsequent extraction by other users, will improve the environmental outcomes achieved.

#### 2.1.2 Active Management

Significant advancements towards the protection of environmental water have been made in line with the *Intergovernmental Agreement on Implementing Water Reform in the Murray-Darling Basin*. Active management is critical to ensuring environmental water can remain and be used instream for its intended environmental purposes within and between connected water resources<sup>1</sup>. Active management has been successfully implemented in several catchments in the Northern Basin since its inception in December 2020 enabling system-scale environmental outcomes to be achieved with environmental water. However, there are still gaps in active management across the Basin which should be addressed as part of reviewing and updating the regulated and unregulated WSPs. This includes the need to expand active management to protect environmental water through the regulated and unregulated Namoi, and some

<sup>&</sup>lt;sup>1</sup> Active Management in Unregulated Rivers Policy

unregulated management zones of the Macquarie and Lachlan. For more information see relevant active management sections for each specific WSP area below.

#### **Recommendation:**

1. Review the rules and provisions in the Lachlan, Macquarie and Namoi WSPs to improve protection of PEW and HEW.

# 2.2 Climate change, variability and streamflow trends

All WSPs need to consider operation under climate change and variability. Higher temperatures, increased evaporation, changes to rainfall patterns and associated flows, and changes to the intensity and duration of dry and wet periods are all emerging risks to the environment and water availability. Under a changing climate, storage management such as the period and volume for essential supplies and allocation processes may need to be reviewed and modified to reduce the risk of drought operation practices (e.g. block releases, quarantining of carryover) becoming implemented more often.

NSW undertook significant climate change scenario analysis and modelling that informed the development of the NSW Regional Water Strategies. In the Lachlan, Macquarie and the Namoi, this work indicated that droughts may occur more frequently, the probability of cease-to-flow conditions may increase, and flood frequency may decrease. These changes may be coupled with higher temperatures, increased evaporation, reduction in average rainfall, changes to rainfall patterns and associated flows, and changes to the intensity and duration of dry and wet periods<sup>2</sup>. Such scenarios may result in lower allocations for both environmental and extractive users, coupled with increased demands and reduced other flows to aid in maintenance of environmental assets in the regulated and unregulated systems. This is likely to have implications for sustainable levels of take and long-term extraction limits.

#### 2.2.1 Minimum inflows and drought of record

In NSW water sharing is based on the principle that enough water must be available to meet high priority needs through a repeat of the driest observed inflow period prior to a particular date specified in the WSPs. This minimum inflow period is used to calculate Available Water Determinations and allocate to different licences and rules according to the WSP.

The Lachlan, Macquarie and Namoi WSPs use the minimum inflow sequences prior to the commencement of the first WSP on 1 July 2004. However, this reference point does not reflect the worst drought on record in these catchments during 2017–2020<sup>3</sup>. Minimum inflow sequences in the Lachlan were also lower than the reference point during the Millennium

<sup>&</sup>lt;sup>2</sup> Lachlan Regional Water Strategy; Macquarie-Castlereagh Regional Water Strategy; Namoi Regional Water Strategy

<sup>&</sup>lt;sup>3</sup> The 2017-20 drought | NSW Government Water

Drought and in the Namoi in the period between 2013–2016. During these record dry conditions (i.e. 2019), parts of the Lachlan, Macquarie and Namoi WSPs were suspended. General security allocations and environmental water allowances were quarantined to meet critical human needs. This resulted in considerable uncertainty for the community and had significant impacts on the environment. We understand that NSW has commenced a project to review the minimum flows reference in the WSPs<sup>4</sup>.

#### **Recommendations:**

2. Review and update the minimum inflow period in the Lachlan, Macquarie and Namoi WSPs to better reflect worst drought conditions and reduce the need to suspend parts of the WSP during dry times.

#### 2.3 Connectivity

In 2024, the NSW Connectivity Expert Panel provided advice on the adequacy of rules in the Northern Basin WSPs to support hydrological connectivity. The panel reported that reduced connectivity is having severe impacts on ecosystem health and downstream communities and that insufficient progress has been made in improving connectivity outcomes<sup>5</sup>. The panel made a series of recommendations to improve connectivity and baseflows, including protections for small fresh and large fresh flows in the northern Basin, and identified substantial ecological, social and cultural benefits to downstream communities from doing so. We understand that NSW is reviewing the panel's recommendations to inform proposed amendments to WSPs. The CEWH encourages NSW to consider different scales of connectivity and supporting connectivity under a range of conditions (dry to wet). It will be important to consult with water users, environmental water managers and the community about proposed changes.

#### **Recommendations:**

3. Review WSP provisions following the NSW Connectivity Expert Panel's recommendations including to better support connectivity within catchments and downstream with the Barwon–Darling.

## 2.4 Floodplain Harvesting

Unlicenced and unmanaged floodplain harvesting has significant negative impacts on the health of our waterways and the communities that rely upon them. Australia's framework for water reform, <u>the National Water Initiative</u> (NWI) identifies floodplain harvesting as a form of take that, when not controlled, forms a risk to the integrity of water access entitlements. In 2004, Basin

<sup>&</sup>lt;sup>4</sup> Minimum Inflows Method Review – Terms of Reference

<sup>&</sup>lt;sup>5</sup> Connectivity Expert Panel: Final report, July 2024

states agreed that floodplain harvesting should be licenced, measured and subject to rigorous compliance, as a matter of priority.

The CEWH supports progress to regulate floodplain harvesting. Appropriate triggers and/or event management should guide restrictions and commencement of floodplain harvesting to protect events or portions of events that are important for local and downstream environmental and human needs. Environmental water should be protected from floodplain harvesting take.

The CEWH has previously made submissions on floodplain harvesting (e.g. to NSW Senate Select Committee Inquiry on Floodplain Harvesting<sup>6</sup>) which outline key principles required for floodplain harvesting that are relevant to the review of the Macquarie and Namoi WSPs. Other CEWH submissions on Floodplain Harvesting are also available on the <u>Submissions and reviews</u> page of the CEWH's website.

#### Recommendations

4. Ensure WSP rules are sufficient to protect held environmental water from floodplain harvesting take.

## 2.5 Water Quality

Water quality issues, algal blooms and fish death events are becoming increasingly prevalent across the Basin. Poor water quality affects town water supply, use for irrigation and stock and cultural outcomes as well as the environment. There have been calls to use water for the environment to address water quality issues and/or algal blooms in town water supplies and river systems in the Lachlan, Macquarie and Namoi. However, water quality is a shared responsibility for all water users who are benefiting from regulation and water management in the system.

All WSPs need to include adequate provisions that support the management of ongoing water quality as well as management strategies, rules and procedures to respond to water quality emergencies. These rules and strategies should not be reliant on held environmental water to respond to water quality incidents and underpin the operation of the WSP. The review should consider a range of potential options including water quality allowance, end-of-system flow rules, and minimum or refuge flows. This should not be based on re-purposing of held or planned environmental water to a water quality allowance.

#### **Recommendation:**

5. Include specific rules and provisions in the Macquarie and Namoi WSPs to support the water quality objectives in the WSPs, particularly during dry conditions.

<sup>&</sup>lt;sup>6</sup> Letter to NSW Senate Select Committee Inquiry – Floodplain Harvesting and attachment Floodplain Harvesting Principles

## 2.6 Reasonable use guidelines for basic landholder rights

Currently, riparian landholders can take water from rivers (including during environmental flow events) for stock and domestic purposes under basic landholder rights. While NSW has a Natural Resource Access Regulator to ensure compliance with rules associated with water take, it currently does not have rules or guidelines that this regulator can use to assess whether the volume of take of water for basic landholder rights is reasonable. It is important that NSW completes and releases Reasonable Use Guidelines (s.336 of the *Water Management Act 2000*) as soon as possible.

#### **Recommendation:**

6. NSW complete and publish 'reasonable use guidelines' for the take of stock and domestic water and basic landholder rights as a matter of priority.

## 2.7 First Nations cultural values, uses and benefits

The CEWH acknowledges Traditional Owners and First Nations people across the Murray-Darling Basin and the deep cultural, social, environmental, spiritual, and economic connections they have to their land, water and sky Country. First Nations people have longstanding and continuing ties to Country, including the rivers, wetlands and floodplains across the Basin. The CEWH encourages improving the access and use of water for cultural, social, environmental, spiritual and economic benefits for First Nations people. First Nations people should be supported to determine how they access and use water to achieve economic benefits. The CEWH looks forward to the release of the NSW Aboriginal Water Strategy to understand how its priorities will contribute to improved outcomes for First Nations people in NSW.

## 2.8 Meaningful monitoring, evaluation and reporting

The WSPs set objectives and performance indicators for environmental, cultural, social and economic outcomes. In addition, the Lachlan and Macquarie Surface Water Monitoring, Evaluation and Reporting Plans conceptually link the WSP's environmental objectives to both Long Term Watering Plan and Basin Plan objectives, and reporting on monitoring outcomes against the requirements of Schedule 12 of the Basin Plan. The Namoi Water Resource Plan and associated monitoring and evaluation plan is yet to be accredited.

NSW DCCEEW has developed the Environmental Outcomes Monitoring and Research Program (EOMRP) to improve the ability to assess the effectiveness of water sharing rules and water management in NSW<sup>7</sup>. While work under this program has commenced it is currently difficult to assess the extent to which the WSPs are contributing to environmental, cultural, social and

<sup>&</sup>lt;sup>7</sup> Environmental Outcomes Monitoring and Research Program | NSW Government Water

economic outcomes from this work. There are numerous monitoring and research projects underway, some of which have made recommendations in relation to flows but many are ongoing. This work should be considered in reviewing the WSPs and potential amendments.

#### **Recommendation:**

7. NRC should consider whether monitoring associated with the relevant WSPs is sufficient for the evaluation and improvement of those plans.

# 3 Lachlan Regulated Water Sharing Plan 2016

## 3.1 Context

Approximately 19% of licences in the regulated Lachlan River, or 127 GL of licensed water entitlements are managed by state and federal environmental water holders. The majority of these licences are general security licences. Of which, the CEWH currently manages 89,230 ML of General Security and 933 ML of High Security. The Water Sharing Plan for the Lachlan Regulated River also includes an environmental water allowance, a water quality allowance and daily environmental releases (also referred to as translucent flows).

# 3.2 Specific issues

#### 3.2.1 Water Quality

The Lachlan WSP provides for a water quality allowance<sup>8</sup> (WQA) of 20,000 ML. While historically there was low utilisation of the WQA, in recent years this has changed.

For example, in 2023 WQA was used to dilute rising salinity (electrical conductivity) in the Lachlan River at Cowra until the end of June 2023. Subsequently red alerts for blue green algae were issued in the lower Lachlan, however there was insufficient volume available in the WQA to provide the required dilution flows. Held environmental water was relied upon to mitigate low oxygen concentrations and reduce the potential for a hypoxic event. Similarly, in 2024 WQA was used to mitigate blue green algae blooms by adding 100 ML/day on top of end-of-system flows during the warmer months. Lake Brewster was then identified as a source of blue green algae in the lower Lachlan system, with WQA being used to release 500 ML/day on top of operational flows at Willandra Weir. Again, WQA was exhausted prior to water quality returning to safe levels and held environmental water was relied upon to mitigate potential hypoxic events.

The likelihood of more frequent heatwave events under a changing climate means the risk of water quality issues is increasing. The current provisions for WQA should be reviewed, particularly within the context of inadequate end-of-system flow requirements and inappropriate Lake Brewster protocols, as outlined below. All beneficiaries of water management and/or regulation should contribute to responding to water quality issues.

#### 3.2.2 Inadequate end-of-system flow requirements

End-of-system flow parameters have the potential to provide an important source of water for environmental assets within the Lachlan regulated water source as well as being essential for river communities. These flows are critical for maintaining water quality during extreme dry and

<sup>&</sup>lt;sup>8</sup> Clause 56 Water quality Allowance

hot periods. Existing WSP provisions should be reviewed, along with other key ecological and flow information, to consider whether current end-of-system flow conditions are adequate.

The WSP states that "the operator must ensure that a visible flow is maintained in the Lachlan River at Geramy to provide for domestic supply and stock watering"<sup>9</sup>. In practice, to achieve visible flow at Geramy a flow of 50 ML/day at Booligal gauge (412005) is necessary.

However, higher level flows have been identified as being needed to deliver required outcomes. For example, the Lachlan Long Term Water Plan estimates the Western Lachlan Watercourse planning unit base flow as between 50 and 150 ML/day. Base flow provides connectivity between pools and riffles and along channels and allows sufficient depth for fish to move along reaches. In line with this, Wallace and Bindokas (2011)<sup>10</sup> determined the minimum flow requirements to prevent the onset of thermal stratification at Booligal to be 115 ML/day. As this flow rate is enough to disrupt thermal stratification, it is anticipated that it would also help reoxygenate weirs and refuge pools, mitigate low flow hypoxia and reduce harmful algal growth. It has been widely accepted that a flow rate of ~500 ML/day at Hillston (412039) and a flow of ~150 ML/day at Booligal (412005) is required, at a minimum, to maintain appropriate water quality parameters for social, environmental and recreational purposes.

#### 3.2.3 Lake Brewster protocol not fit for purpose

A number of protocols and processes already exist in the Lachlan for the management of Lake Brewster including:

- Lakes Cargelligo and Brewster Algal Warning System and Storage Operating Protocol
- Lachlan West Regional Algal Contingency Plan
- Lake Brewster Land and Water Management Plan

In 2023 and 2024 potentially toxic cyanobacteria numbers reached the red-alert level and resulted in the quarantine of Lake Brewster, making it unavailable for consumptive or environmental use. Mitigation measures, including circulating water through the Brewster system and filtering via the outflow wetlands, were not undertaken due to the absence of clear operating procedures. A review of the 'Lakes Cargelligo and Brewster Algal Warning System and Storage Operating Protocol' is required to adequately meet the targeted environmental objective<sup>11</sup> of the WSP; *"water quality within target ranges for the water source to support water-dependent ecosystems and ecosystem functions"* 

Further, WaterNSW is responsible for the fortnightly (May-Nov) and weekly (Dec-April) testing of blue green algae levels at key sites. The processing and analysis of samples can take up to 10 days. This means that river operators are making decisions with out-of-date and/or irrelevant

<sup>&</sup>lt;sup>9</sup> Clause 8; Section 3 (f) (Environmental objectives)

<sup>&</sup>lt;sup>10</sup> Wallace TA and Bindokas J (2011) The impact of drought on water quality and fish communities within refuge pools in the Lachlan River. Final Report prepared for the Lachlan Catchment Management Authority by The Murray-Darling Freshwater Research Centre, MDFRC Publication 20/2011, August, 104pp

<sup>&</sup>lt;sup>11</sup> Clause 8; Section 2 (iii) (Environmental objectives)

data. Funding and deployment of automatic, real-time water quality monitoring is necessary to ensure adaptive and timely management of water quality.

#### **Recommendations:**

- 8. Provision of minimum daily flow rate of ~500 ML/day at Hillston (412039) and ~150 ML/day at Booligal (412005) between December to April to maintain water quality within target ranges for environmental, basic landholder rights, town water supply, licensed domestic and stock purposes and surface water-dependent cultural, heritage and recreational uses.
- WaterNSW, in collaboration with environmental water managers and other water users, should review the 'Lakes Cargelligo and Brewster Algal Warning System and Storage Operating Protocol'.
- 10. WaterNSW install and maintain automatic, real-time water quality monitoring in Lake Brewster storage and between Willandra and Wallanthery to ensure adaptive and timely management of water quality.

#### 3.2.4 Rates of release from Wyangala Dam

Despite a requirement for the Minister to establish an operating procedure by June 2012 to minimise the effects of flow releases from Wyangala Dam on the stranding of aquatic organisms and erosion of riverbanks downstream of the dam including minimising the impacts of operations of Wyangala hydroelectric station (HEPS), this has not happened to date.

In the absence of an operating protocol, held environmental water is often used in the Lachlan to slow the rate of recession with airspace releases and translucency at a nominal 20% fall rate applied to most flows. Across the Southern Murray-Darling Basin a range of other rates of fall are applied operationally (e.g. "6 inch rule"<sup>12</sup>).

NSW DCCEEW is in the early stage of creating a model to show rates of change at different gauge points in the Lachlan regulated system <sup>13</sup>. This model draws on a dataset from 1895 to current flow rates. The data is spilt into a modelled 'without development' (WoD) which shows estimated flow rates if there was no water infrastructure and also distinguishes data pre and post-1970 upgrade to Wyangala dam. Outputs from this model are shown in Table 1. Until further studies can be done to investigate the impact of high rates of change, rates of recession should not exceed the modelled maximum rate of recession for managed flows (see table below).

 <sup>&</sup>lt;sup>12</sup>For more information on 'six inch rule' see <u>final-modelling-assessment-to-determine-sdl-adjustment-volume-1.pdf</u>
<sup>13</sup> NSW-DCCEEW-BCS (2023), A guide from draft analysis of modelled flow rates without development, unpublished.

Flow range (ML/day)	Recommended rate of recession (% change from previous day)
0 - 2,499	21
2,500 - 4,999	21
5,000 - 7,499	20
7,500 - 9,999	19
10,000 - 14,999	18
15,000 - 20,000	8

Table 1: Modelled maximum rate of recession for managed flows.

In addition, the daily use from the Wyangala hydroelectric station has seen unsatisfactory intraday fluctuations. A sample study from May 2024 shows flow variation, with flows observed to change in height as much as 25%, rising from 1.5 m to 2 m in 2 hours and receding the same amount over the following 22 hours (Figure 1). When represented as a flow rate, that changes from 100 ML/day (instantaneous measurement) to 1,200 ML/day (instantaneous measurement) in 2 hours. Although the largest impact of the intraday fluctuation is only experienced for the first <100 kms, preliminary studies and anecdotal evidence suggest that intraday fluctuations are exacerbating erosion and bank slumping in the immediate 100 km of river corridor below Wyangala Dam, which is contributing to infill of critical fish and platypus refuge.



Figure 1. Observed flows downstream of Wyangala for the week starting 14 May 2024. (Source: <u>Real-time water</u> <u>data</u>).

#### **Recommendations:**

- 11. An operating procedure should be developed to minimise the effects of flow releases from Wyangala Dam on the stranding of aquatic organisms and erosion of riverbanks downstream of the dam, including minimising the impacts of operations of HEPS.
- 12. WSP rules to include maximum rates of recession as shown in Table 1.

#### 3.2.5 Erosion of replenishment flows

Anecdotal evidence suggests that the replenishment flow described in Clause 59(1c) of the WSP of "up to 9,000 ML/year to the Torrigany, Muggabah and Merrimajeel Creeks Trust District downstream to the Murrumbidgil Swamp (Angorra Clump)"<sup>14</sup> was historically interpreted as flows ceasing when they reached the central part of the Murrumbidgil Swamp. We understand that the intent of Clause 59(1c) is that flows cease only once they reach the central part of the Murrumbidgil Swamp.

Over time, and with changes in river operator personnel, this clause has been interpreted differently and current practice is that replenishment flows cease once they reach the swamp's edge (i.e. before the swamp begins to fill). Although grid references are provided, these maps are not readily available and are no longer fit for purpose. The CEWH recommends these provisions include a GPS coordinate to reduce confusion or misinterpretation of intent.

#### **Recommendations:**

- 13. All replenishment flow requirements in the Lachlan are reviewed to improve clarity and to consider the climate variability risks to the occurrence/provision of flows and the adequacy of replenishment flows.
- 14. Clearly exclude HEW and planned environmental water (namely translucency flows) as an available source of water for replenishment flows.

<sup>14</sup> Clause 59; Section 1 (c)

# 4 Macquarie-Cudgegong Regulated Water Sharing Plan2016

# 4.1 Context

The CEWH currently manages 126,224 ML of General Security and 8,292 ML of Supplementary entitlements in the Macquarie catchment. Over the last 15 years, Commonwealth held environmental water has been delivered with NSW held and planned environmental water to achieve a range of environmental outcomes in the Macquarie catchment and to support connectivity with the Barwon River.

The ability to meet the environmental objectives of the Macquarie WSP requires all components of the flow regime. For example, baseflows and small fresh flows support longitudinal connectivity allowing aquatic animals to move and breed and improve water quality. These flows can support connection between the Macquarie and Barwon rivers.

The WSP rules that enable Flood Mitigation Zone releases for beneficial flooding are critical for inundating the broader Macquarie Marshes, supporting large-scale waterbird breeding and helping native fish to breed and move along and between river systems. These events cannot be achieved by held environmental water. The translucent environmental water allowance and the supplementary access threshold provide flow rates and natural cues that support inundation, river productivity and native fish lifecycles.

The Macquarie Regulated WSP provisions may be less effective at meeting environmental objectives in dry times. Several of the replenishment flows, such as those to the Gum Cowal and Effluent Creeks, rely on uncontrolled flows which are less likely to occur during dry times.

The extreme drought conditions across the Northern Basin between 2017 and early 2020 severely impacted native fish and wetland ecosystems in the Macquarie Valley. A series of fish death events in early 2020 further reduced the Macquarie native fish stocks. The duration of cease-to-flow periods along the Macquarie River downstream of Warren increased significantly during the recent drought compared to the preceding years (Figure 2). This has implications for supporting critical environmental outcomes.



Figure 2. Flows at the Macquarie River at downstream Marebone and Carinda (Bells Bridge) from 1975 to 2020. Cease to flow periods are marked in yellow. Source: Real-time data.<sup>15</sup>

### 4.2 Specific issues

#### 4.2.1 Replenishment flows

The rules in the regulated and unregulated water sharing plans in the Macquarie do not adequately prevent water intended for the environment from being used for other purposes, such as for replenishment flows.

The Macquarie Regulated WSP includes clauses to provide replenishment flows to several unregulated water sources including the Gum Cowal/Terrigal, Marra Creek, Crooked Creek, Bogan River, Beleringar Creek, Reddenville Break, Macquarie River to Oxley Station and from Miltara to the Barwon River. Some replenishment flows are required to be provided while others are only provided if water is available from uncontrolled flows. While the Macquarie Unregulated WSP prevents licences (other than stock and domestic) from taking replenishment flows<sup>16</sup>, the current provisions for replenishment flows under the Macquarie Regulated WSP are insufficient to avoid held environmental water being substituted for replenishment flows<sup>17</sup>.

The use of held and planned environmental water to substitute for replenishment flows can impact on achievement of environmental objectives, reduce the effectiveness of held environmental water and shifts the responsibility and costs of providing these flows to environmental water licences. The replenishment flow provisions should clearly articulate the

<sup>&</sup>lt;sup>15</sup> <u>https://www.dcceew.gov.au/sites/default/files/env/pages/dca287c3-73bd-4ec1-a3b1-c29dd5cf95f9/files/cewh-submission-nsw-review-mgt-northern-basin-first-flush-event.pdf</u>

<sup>&</sup>lt;sup>16</sup> Macquarie Bogan Unregulated Water Sharing Plan, Pt.6 s.34(11)

<sup>&</sup>lt;sup>17</sup> Macquarie Cudgegong Regulated Water Sharing Plan 2016, Pt.10 s.84

source of water for replenishment flows and specify that they should not be sourced from held or planned environmental water.

There is also a replenishment flow requirement for Milmiland Creek specified in a works approval that is not included in the regulated water sharing plan. The opening of the regulator during deliveries of water for the environment to supply this replenishment flow can compromise inundation in parts of the Macquarie Marshes and associated environmental outcomes. Additional information can be found in the CEWH submission to the NRC on the 2023 Review of the Macquarie Bogan Unregulated WSP<sup>18</sup>.

#### **Recommendations:**

- 15. Clearly exclude held environmental water as an available source of water for replenishment flows.
- 16. The Macquarie Regulated WSP should specify the stock and domestic/replenishment flow to Milmiland Creek and the source of water (e.g., uncontrolled flows or dam reserves) to formalise and recognise this practice and ensure consistency with other replenishment flows.
- 17. Replenishment flow requirements in the Macquarie WSP are reviewed to improve clarity and to consider the climate variability risks to the occurrence/provision of flows and the adequacy of replenishment flows.

#### 4.2.2 Active Management Gaps

There are gaps in the protection of held environmental water in some unregulated water sources of the draft WSP such as Ewenmar Creek, Lower Bogan, Marra Creek and Backwater Boggy Cowal.

In 2018–19, CEWH and NSW environmental water managers delivered water to critical refuge sites on the Ewenmar Creek and the Nyngan Weir pool to protect populations of threatened species during extreme drought. There is the potential for CEWH and/or NSW environmental water managers to deliver environmental water to support environmental water requirements in assets in other unregulated water sources such as Ewenmar Creek, Lower Bogan, Marra Creek and Backwater Boggy Cowal within the 10-year life of the water sharing plan.

The active management provisions in the draft WSP do not currently protect held environmental water in these management zones<sup>19</sup>. However, the Report Cards for the Ewenmar Creek, Marra Creek, Lower Bogan indicate active management is in place in these water sources. This inconsistency needs to be addressed. The provisions in the draft WSP should ensure that that

<sup>&</sup>lt;sup>18</sup> WSP reviews - 2023 Completed reviews

<sup>&</sup>lt;sup>19</sup> Macquarie Bogan Unregulated Water Sharing Plan XXXX, Pt.6 s.34(23) – (25)

arrangements will explicitly protect held environmental water in the Ewenmar Creek, Lower Bogan, Marra Creek, and Backwater Boggy Cowal management zones.

Currently only the HEW from the Macquarie is protected into the Barwon–Darling. The active sub-allowance of the Environmental Water Allowance (EWA 2 – Discretionary) is only protected to the end of the unregulated Lower Macquarie River. Protecting the active sub-allowance in the Barwon River could enhance connectivity, water quality and native fish outcomes in the Barwon–Darling.

The active management provisions appear to be insufficient to protect environmental water from floodplain harvesting in the Macquarie. The restrictions on floodplain harvesting in the Macquarie WSP only protect active environmental water in the Gum Cowal and Macquarie River Upstream Management Zone. Environmental water is delivered to and through other zones in the Macquarie Marshes floodplain such as Lower Macquarie Downstream Management Zone and the Marthaguy.

Additionally, at flows volumes that would trigger floodplain harvesting it is likely that a component of the flow event will be from planned environmental water. All components of environmental water should be protected to meet the intended environmental outcomes. Notably, the current Active Management Procedures for the Macquarie manual do not address floodplain harvesting.

#### **Recommendations:**

- Protect held environmental water in other unregulated water sources of the draft WSP such as Ewenmar Creek, Lower Bogan, Marra Creek and Backwater Boggy Cowal water sources.
- 19. Extend active management to protect the active EWA into and through the Barwon– Darling to contribute to system connectivity and critical environmental need targets.
- 20. Ensure WSPs include rules to ensure that both HEW and planned environmental water is adequately protected from floodplain harvesting.

# 5 Namoi Regulated Water Sharing Plan

# 5.1 Context

As at 31 January 2025, the CEWH manages 16,241 ML of General Security entitlements, 9,883 ML of Supplementary entitlements and 4,668 ML of unregulated entitlements in the Lower Namoi and 105 ML of General Security entitlements in the Upper Namoi and 1,257 ML of General Security entitlements in the Peel.

The supplementary access rules in the Namoi WSP provide a share of the event for the environment, with a greater level of protection between 1 July and 31 October which can be an important time for riverine productivity and for native fish to access food and nesting sites. The supplementary access thresholds vary depending on the location along the river and where the uncontrolled flows originated from. The level of protection provided for the environment reduces when total allocations of water to general security in the Lower Namoi are less than or equal to 90,000 ML, meaning there is less water left instream during dry times.

The Namoi WSP also includes restrictions on supplementary water use in relation to targets in the Barwon–Darling, and restrictions on floodplain harvesting in relation to Namoi targets and Menindee Lakes. Restrictions on supplementary and floodplain harvesting take are important to help support downstream connectivity and environmental water requirements, particularly during moderate to wet times. However, these targets may need to be revised to improve provision for connectivity and critical human and environmental needs downstream.

The minimum flow rules provide a very low flow to Goangra (formerly Walgett but the relevant Walgett gauge has been decommissioned) in the months of June, July and August. However, these flows are only provided when the combined dam storage is greater or equal to 120,000 ML. Therefore, the winter minimum flow rule does not support the system in dry years. There is no end of system minimum flow rule for other times of the year.

Cease to flow events, water quality issues and fish death events<sup>20</sup> are occurring more frequently in the Namoi River. This has implications for meeting environmental, social and cultural objectives in the WSP. The WSP provisions are important to support the ecosystems of the Namoi throughout the year and particularly during dry times when there may be limited rainfall events and falling dam levels and water in general security accounts.

<sup>&</sup>lt;sup>20</sup> Fish kills in NSW



Figure 3. Flows at the Namoi River at Goangra from 1975 to 2020. Cease to flow periods are marked in yellow. Source: Real-time data.<sup>21</sup>

In dry times the Namoi WSP provisions may provide very little, or no water to support the river and its ecosystems, particularly outside the irrigation season. Based on the above, the current Namoi Regulated WSP provisions do not appear to adequately protect the water source and its dependent ecosystems.

## 5.2 Specific issues

#### 5.2.1 Active Management

The CEWH currently manages 2,562 ML of unregulated entitlements in the unregulated Namoi system, specifically in the Coghill and Pian Creek management zones. Water from these unregulated management zones may flow into the regulated Namoi. There are no active management provisions in the regulated or unregulated Namoi WSP to protect this water from extraction from unregulated take or floodplain harvesting. Ensuring the CEWH's water, once delivered, cannot be subsequently extracted ensures that the water can contribute to meeting environmental demands in the Namoi and in the Barwon–Darling.

#### **Recommendation:**

21. Include provisions in the Namoi WSP to ensure environmental water in the Namoi water source (e.g. general security, supplementary, unregulated) cannot be taken by other users.

# 5.2.2 Protect held environmental water from the Peel into the Namoi to support connectivity within and between water sources

Currently, held environmental water in the Peel can be re-regulated or extracted when it reaches the Lower Namoi water source.

<sup>&</sup>lt;sup>21</sup> https://www.dcceew.gov.au/sites/default/files/env/pages/dca287c3-73bd-4ec1-a3b1-c29dd5cf95f9/files/cewh-submission-nsw-review-mgtnorthern-basin-first-flush-event.pdf

While the volume of Commonwealth environmental water holdings in the Peel is modest, reregulation of held environmental water can result in less water available for protecting hydrologically connected downstream environments in the Namoi. Preventing re-regulation of held environmental water would allow these flows to provide connectivity benefits and support ecosystems downstream and would also enable deliveries of held environmental water from the Peel and Namoi to be coordinated for connectivity and other environmental benefits. This may help contribute to meeting LTWP and Basin-wide environmental watering strategy outcomes.

#### **Recommendation:**

22. Amend the Namoi WSP to protect held environmental water from the Peel from extraction in the Namoi to support connectivity within and between water sources and environmental outcomes downstream.

#### 5.2.3 Surface-groundwater interactions and sustainability

Groundwater and surface water in the regulated Namoi River are intricately linked<sup>22</sup>. While groundwater is not part of the regulated WSP, groundwater and surface water systems need to be managed as an interconnected single source. Groundwater is important in providing water for stock, domestic, irrigation and industry, and supporting terrestrial and aquatic ecosystems<sup>23</sup>. During extended dry periods, groundwater can be critical for maintaining refuges in parts of the river. However, groundwater withdrawals have changed some parts of the Namoi River from gaining to losing systems<sup>24</sup>. This may have occurred in other river systems and has the potential to affect the river's resilience to drought (e.g. impact on baseflows) as well as impact on ecology and vegetation that may be reliant on these flows.

It is important that the Namoi WSP establishes sustainable levels of take and appropriate buffer distances to ensure adequate protection of groundwater dependent ecosystems, environmental assets and interconnected river systems. Given the history of groundwater extraction in the Namoi-Peel systems, it may be valuable to review the status of the groundwater systems in the Namoi to ensure the long-term sustainability of the alluvial water source is maintained by the current sustainable diversion limit and rules in the Namoi WSP plan. This could consider, with increased reliance on groundwater systems during extended dry periods, whether these systems are being recharged adequately during wetter times and identify any consequent effects on flows in surface water systems and groundwater dependent ecosystems. Particularly as it can take years or decades for the impact of groundwater extraction to be transmitted through the aquifer system. The impacts of climate change on groundwater and interconnected surface water systems could also be re-examined in such a review. It would also be useful to assess the

<sup>&</sup>lt;sup>22</sup> O'Rourke, M., (2010), Peel Valley Catchment; Groundwater Status Report – 2010, NSW Office of Water, Sydney.

 <sup>&</sup>lt;sup>23</sup> Green D., Petrovic J., Moss P., Burrell M. (2011) Water resources and management overview: Namoi catchment, NSW Office of Water, Sydney
<sup>24</sup> Kelly B. F. J., Timms W. A., Andersen M. S., McCallum A. M., Blakers R. S., Smith R., Rau G. C., Badenhop A., Ludowici K., Acworth R. I. (2013).
Aquifer heterogeneity and response time: the challenge for groundwater management. Crop and Pasture Science 64, 1141-1154.

adequacy of the existing groundwater monitoring network in monitoring impacts on groundwater-dependent ecosystems.

#### **Recommendation:**

23. Review the Namoi regulated, unregulated and alluvial WSPs to ensure provisions in the WSPs are adequate to ensure the long-term sustainability of both surface and groundwater sources in the Namoi.

#### 5.2.4 Environmental Water Advisory Group

The Gwydir and Macquarie WSPs provide for establishment of Environmental Water Advisory Groups. There is no equivalent formal consultative mechanism in the Namoi and Peel WSPs that enable the views and local knowledge of local communities to support planning and delivery of environmental water (held and planned) in the Namoi-Peel. Environmental Water Advisory Groups are effective mechanisms for supporting consultation, collaboration, and incorporation of local knowledge in other valleys. The NRC has recommended improved coordination in other valleys such as the Border Rivers.

#### **Recommendation:**

24. Amend the Namoi WSP to establish a Namoi-Peel Environmental Water Advisory Group to formalise interagency and community-based collaboration for the management and coordination of both planned and held environmental water.