



Mr Bryce Wilde
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Dear Mr Wilde

Submission to the review of the Water Sharing Plan for the Macquarie Bogan Unregulated Water Sources 2012 by the Natural Resources Commission

I am pleased to provide a submission to the review of the Macquarie Bogan water sharing plan by the Natural Resources Commission (NRC). The NRC review is an important step in assessing whether water sharing arrangements in the Macquarie Bogan sufficiently balance environmental, social and economic outcomes through mechanisms which are evidence-based, transparent, clear, and equitable. The review is an important step towards re-building community confidence in water management in the Macquarie.

In the Macquarie system, water dependent ecosystems include the internationally significant Macquarie Marshes and the Lower Darling River aquatic ecological community listed under the NSW Fisheries Management Act which includes the Macquarie, Castlereagh, Bogan Rivers and associated species and communities. The Ramsar-listed Macquarie Marshes are located on the Macquarie River between Warren and Carinda.

The Lower Macquarie Water Source Area (includes the Macquarie Marshes and the Lower Macquarie River to the Barwon) has experienced a moderate to high degree of hydrological alteration with increases in duration and frequency of cease to flow events, and a moderate to high decrease in low and baseflows, freshes and overbank events since pre-development. Climate projections undertaken as part of development of the Macquarie Regional Water Strategy show that the Macquarie may experience up to a 50% reduction in inflows by 2070, and a dramatic increase in frequency of drought conditions. This has profound environmental and social consequences. Whilst the last decade has been particularly dry, recent experience since the WSP took effect suggests that the current provisions alone are unlikely to adequately protect some priority ecological assets such as the Macquarie Marshes, flows for fish and other aquatic animals and connectivity with the Barwon in the context of recent and future climate.

The following submission makes 14 recommendations for your consideration. Many of the recommendations are similar to those made by the NRC in reviews of other water sharing plans. These recommendations relate to: ensuring held environmental water is protected within the plan area; ensuring that drought refuges for aquatic biota are protected; implementing active management and other forms of protection of water for the environment; finalising and implementing reasonable use guidelines; formalising interagency and community-based collaboration for the management and coordination of both planned and held environmental water; and enhancing engagement with the Aboriginal community in relation to cultural flows.

I acknowledge the work of the NSW Department of Industry in developing a Water Reform Action Plan, which outlines practical measures to ensure the protection of environmental flows and outcomes in the Macquarie Bogan (through active management), and across other unregulated water sources through the longer-term implementation of an active management regime. These reforms are critical and should continue to be formalised through regulation, as well as policy measures, as a matter of priority.

If your officers have any questions regarding this submission, please contact [REDACTED]
[REDACTED] in my office.

Yours sincerely

[REDACTED]

[REDACTED]

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23 May 2022



Commonwealth Environmental Water Holder submission to the Natural Resources Commission review of the *Water Sharing Plan for the Macquarie Bogan Unregulated Rivers Water Sources 2012*

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. The Commonwealth Environmental Water Office (CEWO) supports the work of the CEWH. The CEWH acknowledges that social, cultural, and economic outcomes, as well as environmental outcomes, are important in achieving a healthy working Murray-Darling 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. Regarding water, the NRC has an important role in testing whether the objectives of the NSW *Water Management Act 2000* are being fulfilled through the provisions and implementation of water sharing plans. The CEWH appreciates this opportunity to make a submission to this important review of the *Water Sharing Plan for the Macquarie Bogan Unregulated Rivers Water Sources 2012* (hereafter referred to as the Macquarie Bogan Unregulated WSP).

In the Macquarie system, water dependent ecosystems include the internationally significant Macquarie Marshes and the Lower Darling River aquatic ecological community listed under the NSW *Fisheries Management Act*¹ which includes the Macquarie, Castlereagh, Bogan Rivers and associated species and communities. The Ramsar-listed Macquarie Marshes are located on the Macquarie River between Warren and Carinda. When fully flooded, the marsh area covers more than 150,000 hectares and is one of the most important colonial nesting waterbird breeding sites in Australia. A reduction in the frequency, size, and duration of flows to the Macquarie Marshes and the diversion of floodwaters within the marshes are key water management issues.

The CEWH currently manages, on behalf of the Commonwealth, 126,224 ML of General Security and 8,292 ML of Supplementary entitlements in the Macquarie Valley. During the last decade, allocations against these entitlements have been delivered with NSW held and planned water to achieve environmental outcomes in the Macquarie Valley and to support connectivity with the Barwon River. While the CEWH does not manage unregulated licences the Macquarie, Commonwealth environmental water and NSW planned and held water flows through unregulated management zones of the Macquarie to the Barwon River. Management of water and rules unregulated management zones upstream of the dams or

¹ [Darling River EEC \(nsw.gov.au\)](http://nsw.gov.au)

that flow into the Macquarie River can also influence regulated holdings and supplementary flows.

Structure of the submission

This submission focuses on environmental outcomes in unregulated areas that can be influenced by water for the environment and provides several recommendations regarding the following submission questions nominated by the NRC:

1. To what extent do you feel the plan has contributed to environmental outcomes?
2. What changes do you feel are needed to the water sharing plan to improve outcomes?

Recommendations are made to enhance:

- recognition of and supporting connectivity throughout the Macquarie system, and between the Macquarie and the Barwon River;
- the protection of planned and held environmental water;
- clear and consistent provision for critical human and environmental needs;
- supporting Cultural values and Cultural flows; and
- equitable and enforceable licence and works approval conditions.

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

The Macquarie Bogan Unregulated WSP has been developed in accordance with the objects² and principles³ of the NSW *Water Management Act 2000*, including *'to provide for healthy and enhanced water sources and water dependent ecosystems and for equitable water sharing among users in these water sources'*.

The targeted environmental objectives of the plan are to protect, contribute to the enhancement of

- the recorded distribution or extent, and population structure, of target ecological populations,
- the longitudinal and lateral connectivity within and between water sources to support target ecological processes, and
- water quality within these water sources to support water-dependent ecosystems and ecosystem functions.

The ability to meet these objectives and support the health of the river and floodplain systems requires all components of the flow regime, from baseflows to overbank flows, across the seasons⁴. 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 and allow native fish to move between the systems⁵ as well as benefiting water quality and other riverine processes.

² Clause 3, *NSW Water Management Act 2000*

³ Clause 5, *NSW Water Management Act 2000*

⁴ [NSW DPIE \(2020\) Macquarie–Castlereagh Long Term Water Plan. Part A: Macquarie–Castlereagh catchment.](#)

⁵ [Davis et al. 2017 making the connection: designing, delivering, and monitoring flows between catchments. DPI Fisheries](#)

Hydrological analyses undertaken to support the Macquarie-Castlereagh Water Resource Plan Area Risk Assessment and the Macquarie Long Term Water Plan (LTWP) indicates the Lower Macquarie Water Source Area (includes the Macquarie Marshes and the Lower Macquarie River to the Barwon) has experienced a moderate to high degree of hydrological alteration with increases in duration and frequency of cease to flow events, and a moderate to high decrease in low and baseflows, freshes and overbank events compared to near-natural conditions⁶. Water sharing plan rules including planned environmental water, licencing conditions and river operations must all be evaluated in the context of working with held environmental water to provide for healthy water sources and water dependent ecosystems, in keeping with Water Management Act and Macquarie Bogan Water Sharing Plan objectives.

The CEWO recognises that NSW has made significant progress by implementing active management arrangements in the unregulated Macquarie, Gwydir and Barwon–Darling, from 1 December 2020. Active management introduced new rules to protect environmental water and provided a practical mechanism to implement existing rules to protect the discretionary component sub-allowance Environmental Water Allowance through unregulated management zones. The amendments to the plan in July 2020 to include rules to protect active environmental water in some unregulated management zones (e.g., Lower Macquarie (upstream and downstream); Gum Cowal; and Lower Marthaguy management zones) should improve the ability to achieve some environmental water requirements in these zones. For example, this should support outcomes such as fish movement and connectivity including with the Barwon. These protections do not extend to all areas covered by the WSP, and do not extend to all currently defined planned environmental water, which if not extracted could contribute to both maintenance of multiple important environmental assets in the Macquarie and connectivity with the Barwon River. Some licence and works conditions still embody extractive-focused historical approaches to system management.

Hydrological analyses undertaken to support the Macquarie-Castlereagh Water Resource Plan Area Risk Assessment and the Macquarie Long Term Water Plan (LTWP) indicates the Lower Macquarie Water Source Area (includes the Macquarie Marshes and the Lower Macquarie River to the Barwon) has experienced a moderate to high degree of hydrological alteration with increases in duration and frequency of cease to flow events, and a moderate to high decrease in low and baseflows, freshes and overbank events compared to near-natural conditions⁷.

Whilst the last decade has been particularly dry, recent experience since the WSP took effect suggests that the current provisions alone are unlikely to adequately protect some priority ecological assets such as the Macquarie Marshes, flows for fish and other aquatic animals and connectivity with the Barwon in the context of recent climate. 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

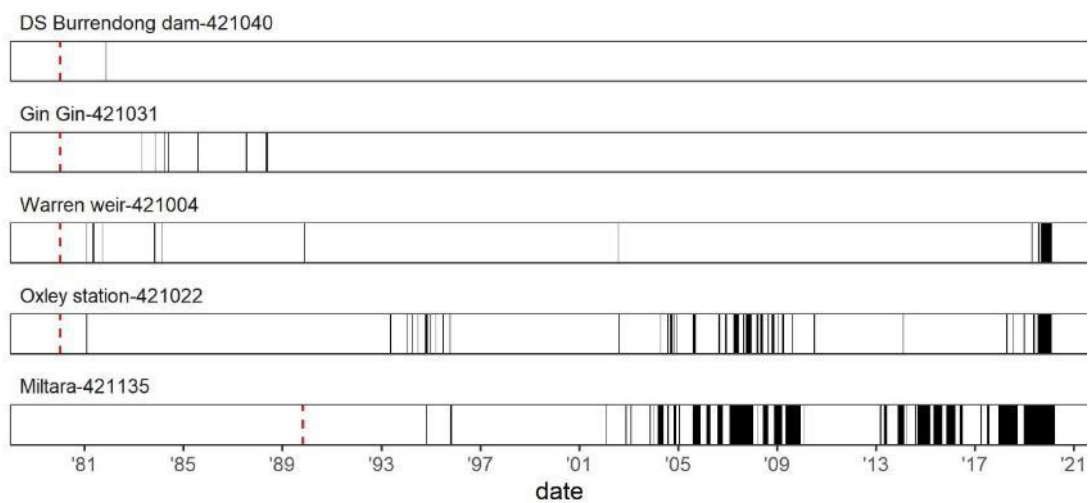
⁶ NSW DPIE (2020) [Macquarie–Castlereagh Long Term Water Plan. Part B: Macquarie–Castlereagh planning units.](#)

⁷ NSW DPIE (2020) [Macquarie–Castlereagh Long Term Water Plan. Part B: Macquarie–Castlereagh planning units.](#)

events in early 2020 further reduced the Macquarie native fish stocks. Emergency rescues of fish and mussels were undertaken by NSW Fisheries and recreational anglers. Cease to flow conditions or very low flows to the Macquarie Marshes for over 12 months impacted on these critically important wetland ecosystems. The duration of cease to flow periods along the Macquarie River downstream of Warren were seen to increase significantly during the recent drought compared to the preceding 37-year period (Figure 1). This has implications for supporting critical environmental outcomes. Climate change is likely to exacerbate this. Future evaluations of the Basin Plan are also important to consider whether the policy settings (including Sustainable Diversion Limits and settings in the WSP) are adequate to achieve the desired outcomes.

a)

Macquarie River



b)

Barwon-Darling River

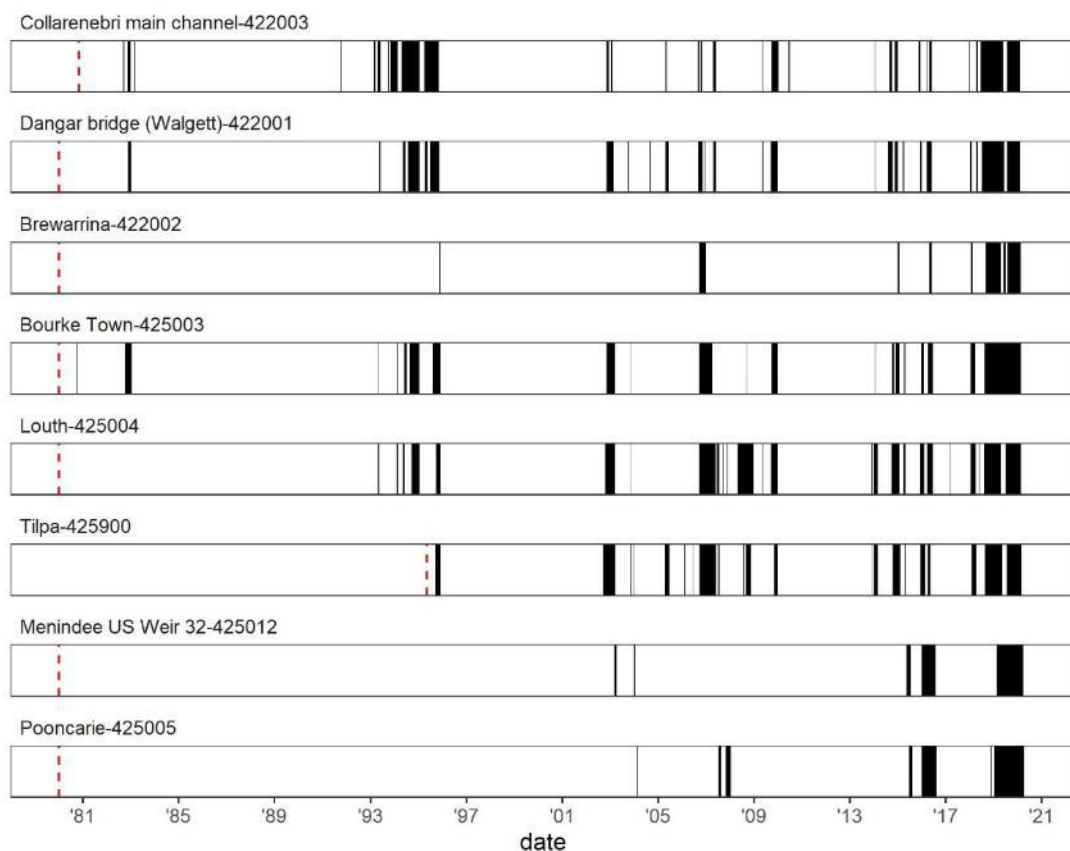


Figure 1 Graphical representations of the cease to flow (CTF) data for gauges in the a) Macquarie River and (b) the Barwon-Darling River. Black lines denote the CTF events and durations. Red dashed line denotes the start of the daily discharge time series.⁸

Based on the above, the current Macquarie Bogan Unregulated WSP provisions are unlikely to adequately protect the water source and its dependent ecosystems and important connections and contributions to the Barwon River. This may be exacerbated in scenarios that are drier or have more concentrated rainfall patterns where reduced or more infrequent inflows, higher temperatures, and increased evaporation result in lower allocations for both environmental and extractive use alike, coupled with increased demands and reduced surplus flows to aid in maintenance of environmental assets in the regulated and unregulated systems. NSW climate projections indicate that by 2070 the Macquarie could see up to a 50% decrease in inflows, increase probably of droughts of 10+ years duration and droughts that occurred once in 1000 years could happen as frequently as once in 50 years⁹ A thorough assessment of the rules in the Macquarie Bogan Unregulated WSP against the LTWP using modelling and other lines of evidence would be needed to test this further. It is requested that the NRC reviews the evidence on whether the Macquarie Bogan Unregulated WSP is adequately contributing to environmental outcomes.

Environmental water requirements for key environmental assets, species and processes are expressed in the Macquarie Long Term Water Plan (LTWP). The LTWP reflects the best

⁸ Sheldon and McCasker (2020). *Habitat and flow requirements of freshwater mussels in the northern Murray-Darling Basin*. Report to the Commonwealth Environmental Water Office.

⁹NSW DPIE (2020). *Draft Regional Water Strategy Macquarie-Castlereagh: Strategy, September 2020*. NSW Department of Planning, Industry and Environment.

available information that can be used to assess whether the WSP has contributed significantly to achievement of environmental outcomes. However, there are still knowledge gaps in the LTWP for many of the unregulated systems in the Macquarie, which need to be addressed to better protect and support environmental outcomes throughout the Macquarie and into the Barwon. Ultimately, there should be better alignment between the Macquarie Bogan Unregulated WSP provisions and the environmental water requirements in the LTWP. Consideration should also be given to the provisions to support the requirements of the Barwon–Darling LTWP and Barwon–Darling WSP.

The *NSW Water Management Act 2000*¹⁰ prioritises water for the riverine environment and basic landholder rights. In unregulated sources the primary means of protecting environmentally important flows is by the pumping access rules in the water sharing plans. Some rules and conditions support lower priority (unregulated licence) access at the expense of high priority access opportunity. Commence to pump thresholds in the Macquarie Bogan Unregulated WSP are lower than environmental water requirements in the LTWP for very low flows, baseflows and small fresh flows and therefore can impact on these flow classes. For example, in the Lower Macquarie, commence to pump thresholds vary significantly and include visible flow, 30 ML/day, 50 ML/day and a suite of others. These access thresholds are inconsistent with the priorities in the Water Management Act and the environmental water requirements in the LTWP. This contributes to more frequent cease to flow conditions, reduce longitudinal connectivity and impact on fish movement and connecting flows to the Barwon and associated environmental outcomes. CEWO makes several recommendations to help better align the plan to environmental objectives in the following section.

The CEWO recognises that NSW has made significant progress by implementing active management arrangements in the unregulated Macquarie, Gwydir, and Barwon–Darling, from 1 December 2020. Active management introduced new rules to protect environmental water and provided a practical mechanism to implement existing rules to protect the discretionary component sub-allowance Environmental Water Allowance through unregulated management zones. The amendments to the plan in July 2020 to include rules to protect active environmental water in some unregulated management zones (e.g., Lower Macquarie (upstream and downstream); Gum Cowal; and Lower Marthaguy management zones) should improve the ability to achieve some environmental water requirements in these zones. For example, this protection should support outcomes such as fish movement and connectivity including with the Barwon.

Based on the above, the current Macquarie Bogan Unregulated WSP provisions are unlikely to adequately protect the water source and its dependent ecosystems and important connections and contributions to the Barwon River. This may be exacerbated further under modelled climate scenarios. The NSW Government has invested in new climate datasets and improved modelling to provide a better understanding of historic climate variability in the Macquarie-Castlereagh region and future climate risks. This work suggests droughts may occur more frequently, the probability of cease to flow conditions may increase, flood frequency may reduce, coupled with higher temperatures, increased evaporation, changes

¹⁰ *NSW Water Management Act 2000* - <https://legislation.nsw.gov.au/view/html/inforce/current/act-2000-092>

to rainfall patterns and associated flows, and changes to the intensity and duration of dry and wet periods¹¹. These scenarios may result in lower allocations for both environmental and extractive use alike, coupled with increased demands and reduced surplus flows to aid in maintenance of environmental assets in the regulated and unregulated systems. A thorough assessment of the rules in the Macquarie Bogan Unregulated WSP against the environmental water requirements in the LTWP using modelling and other lines of evidence would be needed to test this further. The LTWP suggests several management strategies to protect ecologically important flow categories in unregulated river reaches such as reviewing commence to pump thresholds, implementing first flush rules and protecting environmental water¹². It is requested that the NRC reviews the evidence on whether the Macquarie Bogan Unregulated WSP is adequately contributing to environmental outcomes.

Recommendation 1: *That the NRC request NSW Department of Planning and Environment - Water (DPE–Water) to continue working with relevant agencies to manage risks in response to climate change to environmental assets, including the internationally significant Macquarie Marshes and Lower Darling aquatic ecological community, particularly during extended dry periods.*

Recommendation 2: *That the NRC recommends undertaking further work on environmental water requirements, including critical environmental needs, in the unregulated zones of the Macquarie to address some of the existing knowledge gaps and help inform the WSP.*

Recommendation 3: *That the provisions of the Macquarie Bogan Unregulated WSP are reviewed and updated to better support the environmental water requirements in the Macquarie LTWP and Barwon–Darling LTWP and Barwon–Darling WSP.*

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

The Water Sharing Plan could better support low flows, reduce the frequency and duration of cease to flow events, and support inundation of the Macquarie Marshes during environmental deliveries to increase resiliency of water dependent ecosystems. Better definition and consistent protection of both held and planned environmental water, including revision of historical rules and conditions for greater transparency, consistency, and capacity for compliance would aid these objectives. CEWO has previously expressed support for exploration of rules that support end of system flow considerations for upstream tributaries of the Barwon–Darling, as well as other cross-plan mechanisms to support the western regional water strategy connectivity outcomes and implementation of the northwest flow plan.

¹¹ NSW DPIE (2020). *Draft Regional Water Strategy Macquarie–Castlereagh: Strategy, September 2020*. NSW Department of Planning, Industry and Environment.

¹² [NSW DPIE \(2020\) Macquarie–Castlereagh Long Term Water Plan. Part A: Macquarie–Castlereagh catchment.](#)
[NSW DPIE \(2020\) Macquarie–Castlereagh Long Term Water Plan. Part B: Macquarie–Castlereagh planning units.](#)

Active management

The CEWO recognises that NSW has made significant progress to protect environmental water by implementing active management arrangements in the Barwon–Darling, and in unregulated water sources in the Macquarie and Gwydir rivers, from 1 December 2020. The CEWO notes that active management has only been in place for a limited time and has limited application to date. We look forward to seeing the review documents and the continued improvement and engagement on this important work.

Some potential enhancements to active management and provisions in the Macquarie Bogan Unregulated WSP include the following:

- **Expand the list of unregulated sources protected by Active Management in the Macquarie Bogan Unregulated WSP to protect active environmental water deliveries if they occur in future in other unregulated sources (e.g., Ewenmar, Marra, Lower Bogan zones).** In 2018–19, deliveries were made to critical refuge sites on the Ewenmar Creek and the Nyngan Weir pool. Ensuring other relevant unregulated water sources are covered by active management would help transparency, compliance and prevent the need for seeking s324 orders.
- **Provisions to protect the active sub-allowance of the Environmental Water Allowance (EWA 2 – Discretionary) in the Barwon River.** This can enhance connectivity, water quality and native fish outcomes in the Macquarie and the Barwon–Darling and would support objectives and environmental outcomes in the Basin Plan. Currently this allowance is only protected to the end of the Lower Macquarie River. Flows from tributaries of the Barwon–Darling can be critical in supporting the environment in a range of conditions but also to communities particularly during dry times. Connectivity should be addressed in the WSPs for each tributary of the Barwon–Darling.
- **Enhance the transparency of information regarding protected volumes through unregulated management zones** such as the Lower Macquarie (Upper and Lower zones). While announcements are provided for the Lower Macquarie, currently it can be difficult to determine how much water is being protected through the Lower Macquarie and into the Barwon. This information is important for the public and environmental water managers understand how much water is being protected and whether key environmental flow thresholds have been met (e.g., flow rates that provide minimum depths for fish movement during connectivity flows). Ideally this would be in real-time but within event and end of event updates could be a useful interim step to give information about flow rates and volumes protected during events.
- **Wholistic evaluation of properties that have the capacity to take from multiple water sources** including Barwon–Darling, Lower Macquarie, and unregulated creeks to ensure there is an effective mechanism to protect all actively managed environmental water, including effective compliance mechanisms.
- **Integration of active management and floodplain harvesting to ensure that if held environmental water flows onto the floodplain that it is equally protected from**

floodplain harvesting licences as other unregulated licences. This includes events where there are flows of mixed held environmental, planned environmental and other water.

Recommendation 4: *That the NRC encourages NSW Department of Planning and Environment - Water (DPE-Water) to extend active management in other water sources covered by the Macquarie Bogan WSP that have the potential for both held environmental water (or EWA2) delivery and the possibility of extraction by other water users downstream, and that water protected from unregulated licence holders through active management is also protected from floodplain harvesting licences.*

Recommendation 5: *That protection for the water from the Environmental Water Allowance protected under active management in the Macquarie Bogan is extended through the Barwon Darling Water sharing plan to contribute to system connectivity and critical environmental need targets.*

Critical environmental needs

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. Emergency rescues of fish and mussels were undertaken by NSW Fisheries and recreational anglers. Cease to flow conditions or very low flows to the Macquarie Marshes for over 12 months impacting on these critically important wetland ecosystems. Critical environmental needs require better definition and protection by the WSP and other drought management policies and strategies.

Under the Water Management Act 2000 critical human needs are prioritised, followed by the needs of the environment. This is especially important during a severe water shortage where normal rules and operations may be suspended to meet these needs. The NSW Extreme Events Policy forms a framework for the management of a range of extreme events, including extended dry periods. This policy has a staged approach and suggests a range of measures that water managers can adopt as conditions deteriorate during drought. In implementing the policy, the government must ensure it meets its obligations under the Water Management Act. This includes showing that it has considered the needs of the environment when allocating water to other uses, as provided by section 60 of the Act.

Provision for critical environmental needs for the Macquarie must consider:

- minimum volumes to pass into the internationally significant Macquarie Marshes
- critical environmental demands for endangered species and communities such as silver perch, Murray cod, freshwater catfish
- the needs of other water dependent species such as native fish and less mobile species such as freshwater mussels
- minimum flows to manage risks to widespread blue-green algae blooms.
- needs of downstream systems such as in the Barwon River.

These critical environmental must take account of:

- environmental needs specified in long-term environmental water plans
- the current Basin annual environmental watering priorities
- asset and ecological condition
- water quality and other relevant information.

Improved provisions in the Macquarie unregulated and regulated WSPs, as well as drought management strategies to better support critical environmental and human needs are required. This could include examining the effectiveness and appropriateness of commence to pump thresholds and/or implementing a first flush rule to ensure periods between baseflows, small freshes or inundation of core areas of the Marshes are not excessively prolonged. This would help ensure that water for critical human and environmental needs within catchment and downstream connected river systems will be prioritised before other lower priorities under the Water Management Act 2000 (e.g., General Security and Supplementary water).

Recommendation 6: *That the NRC encourages NSW to further identify critical environmental needs in the Macquarie and Barwon and include provisions in the regulated and unregulated WSPs, extreme event policies and drought management strategies to define, support and protect these needs. Measures designed to continue delivery of water that is a lower priority to critical human and environmental needs (i.e., extractive commercial licences) should be evaluated with respect to also meeting the higher priority requirements during extreme dry events.*

Recommendation 7: *That the NRC recommends inclusion within the Macquarie Bogan Unregulated WSP of a resumption of flow rule which allows for flows to be protected from extraction. The resumption of flow rule should replenish important refuges and enhance connection through to the Barwon–Darling after extended dry periods.*

Planned environmental water

Planned environmental water is foundational to the delivery of outcomes under the Water Management Act and the Basin Plan. In accordance with the Act, planned environmental water is water that is committed by management plans for fundamental ecosystem health or other specified environmental purposes, either generally or at specified times or in specified circumstances and that cannot, to the extent committed, be taken, or used for any other purpose. The efficient and effective use of the Commonwealth water holdings are predicated on planned environmental water being protected as per the intention of the Basin Plan (s10.28).

Recommendation 8: *To provide certainty to the management and protection of planned environmental water, further refinement of operational arrangements, improved transparency and definition should be a priority for interagency cooperation.*

Replenishment flows

Replenishment flows are flows provided to refill pools and water holes in effluent river systems downstream of the water source and provide water for household and town use and stock¹³. The *Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2016* includes clauses¹⁴ to provide replenishment flows to several unregulated water sources including the Gum Cowal/Terrigal, Marra Creek, Crooked Creek, Bogan River, Beleringar Creek, Reddenville Break and from Miltara to the Barwon River. The plan specifies when and where those flows will come from (e.g., most from uncontrolled flows or in some cases from reserves in Windamere or Burrendong Dam), with the timing of most being listed as when required. The Macquarie Bogan Unregulated WSP prevents extraction of these replenishment flows except under a domestic and stock access licence for these sources.

The replenishment flow requirements should be reviewed considering climate variability. Higher temperatures, increased evaporation, changes to rainfall patterns and associated flows have the potential to impact on the frequency of flows for replenishment and stock and domestic purposes and the volumes required to provide them. Held environmental water should be treated in the same way as extractive water to the point of delivery, and then in a similar way beyond that. Extractive water can not contribute to downstream replenishment flows because it is no longer in the system and in use on property, so too should held environmental water be in use by environmental assets.

The flow to Milmiland creek expressed in the works approval condition of the regulator is not currently covered by the replenishment flows in the regulated or unregulated WSPs. The Little Milmiland Regulator Works Approval allows for the drop boards to be removed during periods of greater than 230 days with no flow in Milmiland break to provide flows into Milmiland Creek (Marra water source).

The WSP should also specify the stock and domestic/replenishment flow to Milmiland Creek and the source of water (e.g., uncontrolled flows) for this flow to formalise and recognise this practice. The operation of this regulator has a negative impact on the ability of environmental water to contribute to inundation of critical Macquarie Marshes sites following extended dry periods. The proximity of the regulator to the Southern Marshes means that its operation can impact on flows in the Marshes. When removal of the drop boards coincides with deliveries of water for the environment to the Macquarie Marshes it can impact on inundation of the Macquarie Marshes and achievement of environmental outcomes. For example, opening the regulator during environmental releases affected deliveries in 2017–18 and 2018–19. In spring 2018, the extent, depth, and duration of inundation in the Marshes was impacted when the regulator was opened (Attachment A). There was a notable reduction in the depth and area of inundation observed within the wetlands at Old Buckinguy; flows along the Old Macquarie River ceased compromising

¹³ Dictionary, *Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2016*

¹⁴ Part 12, Clause 58, *Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2016*

inundation extent and depth in Mole Marsh and U Block. This includes parts of the Ramsar site. Once the drop boards were reinstated after the 30 days, inundation of the water couch meadows and flows into the Old Macquarie River were unable to be reinstated. Water released to support environmental outcomes in target assets such as the Macquarie Marshes should not be used to substitute for replenishment flows in other systems. Therefore, it is important the flow is not provided by active environmental water.

Recommendation 9: *That all rules and conditions designed to provide replenishment flows are consistently represented in the water sharing plan. Particularly, the operating rules for Milmiland Creek regulator to provide for critical human and environmental needs are brought in line with other replenishment flow rules*

Recommendation 10: *Replenishment flow requirements in the Macquarie are reviewed to consider the climate variability risks to the occurrence/provision of flows and the adequacy of replenishment flows; and ensure replenishment flows are not provided by active environmental water that are meeting environmental needs.*

Commence to Pump Thresholds

Pumping access rules defined in water sharing plans are an important mechanism for protecting planned environmental water and important flows in the unregulated systems. The Barwon Darling Water Sharing Plan has recently been reviewed in keeping with previous recommendations of an NRC review (Final Report: Review of the Water Sharing Plan for the Barwon–Darling Unregulated and Alluvial Water Sources 2012) to enhance the protection of low flows to improve environmental and social outcomes. This recommendation resulted in the alignment and increase of A class commence to pump thresholds (CTPs) in the Barwon Darling to protect more water in the low flow and base flow ranges, and in many cases allowed enough water to remain in the system to meet riparian environmental watering targets outlined in the northwest flow plan. This planned environmental water, along with other low flow protection mechanisms such as the resumption of flows rule, is now used in conjunction with held environmental water from the Barwon Darling and tributaries to efficiently meet critical environmental targets. These CTPs and reference gauge licence conditions operate in such a way that if the water user extracts rapidly enough that they cause the downstream gauge to drop below their licence threshold, their access is cut off until such a time as it reaches the threshold again. In the Macquarie-Bogan, some licences operate in a similar fashion, but other licences that have thresholds similar to each other have a reference gauge above the extraction point, allowing extraction of water at a rate that may cause the stream flow rate to fall significantly below the threshold but have no bearing on their access, the water has already been measured. The water below the threshold is not protected downstream.

Many licences have thresholds defined as ‘visible flow’ have no reference gauge at all, usually because there is no local reliable gauge to use, or water can pass the point of extraction from multiple upstream sources. This poses a problem for compliance processes,

and for active management threshold adjustment to protect held environmental water. Visible flow thresholds also mean that there is no low flow or connectivity protection built into the thresholds.

Recommendation 11: *That flow threshold mechanisms be reviewed to improve connectivity and protect from more frequent cease to flow conditions*

Recommendation 12: *That licence conditions and information systems be reviewed and updated where necessary to ensure effective compliance mechanisms can be put in place. This includes consideration of visible flow conditions not associated with a reference gauge, allowing extraction from on and off stream pools. Licences should also be evaluated for consistency and fairness, such as with respect to being positioned above or below their reference gauge, and the effect that their extraction rate has on their own access and downstream flow and access. Additional gauging may be needed to meet these requirements.*

Supporting cultural values and cultural flows

The CEWH acknowledges the Traditional Owners who have deep cultural, social, environmental, spiritual, and economic connection to their lands and waters. Healthy rivers and full waterholes and weir pools contribute significantly to the health and wellbeing of Aboriginal communities along the rivers. Events such as rivers ceasing to flow or fish death events can be concerning, or even traumatic, for Aboriginal communities.

The Traditional Owners have longstanding and continuing ties to country, and the rivers, wetlands and floodplains in the Macquarie valley and connections with the Barwon–Darling. Many important sites and artefacts exist across the Macquarie and Barwon–Darling systems including traditional burial sites, scar trees, meeting sites, Aboriginal Ceremony and Creation or Dreaming sites. Some sites may be significant because they are a rare example of an ecosystem; others may contain habitat for rare or endangered species, while others provide habitat for migratory bird species. Some species are totemic to Aboriginal communities. Some localities may be particularly significant because they hold spiritual or cultural significance for Aboriginal people. The NRC has made recommendations to support cultural values in other valleys, including recently in the Barwon–Darling.

Recommendation 13: *That the NRC recommends that suitable and enduring steps are taken to enhance engagement with the Aboriginal community in relation to cultural flows and water management including WSP objectives, and if appropriate, establish cultural licences in the Macquarie.*

Reasonable use guidelines for basic landholder rights

Currently, riparian landholders can take water from the river (including environmental flow events) for stock and domestic purposes under basic landholder rights. While NSW has a

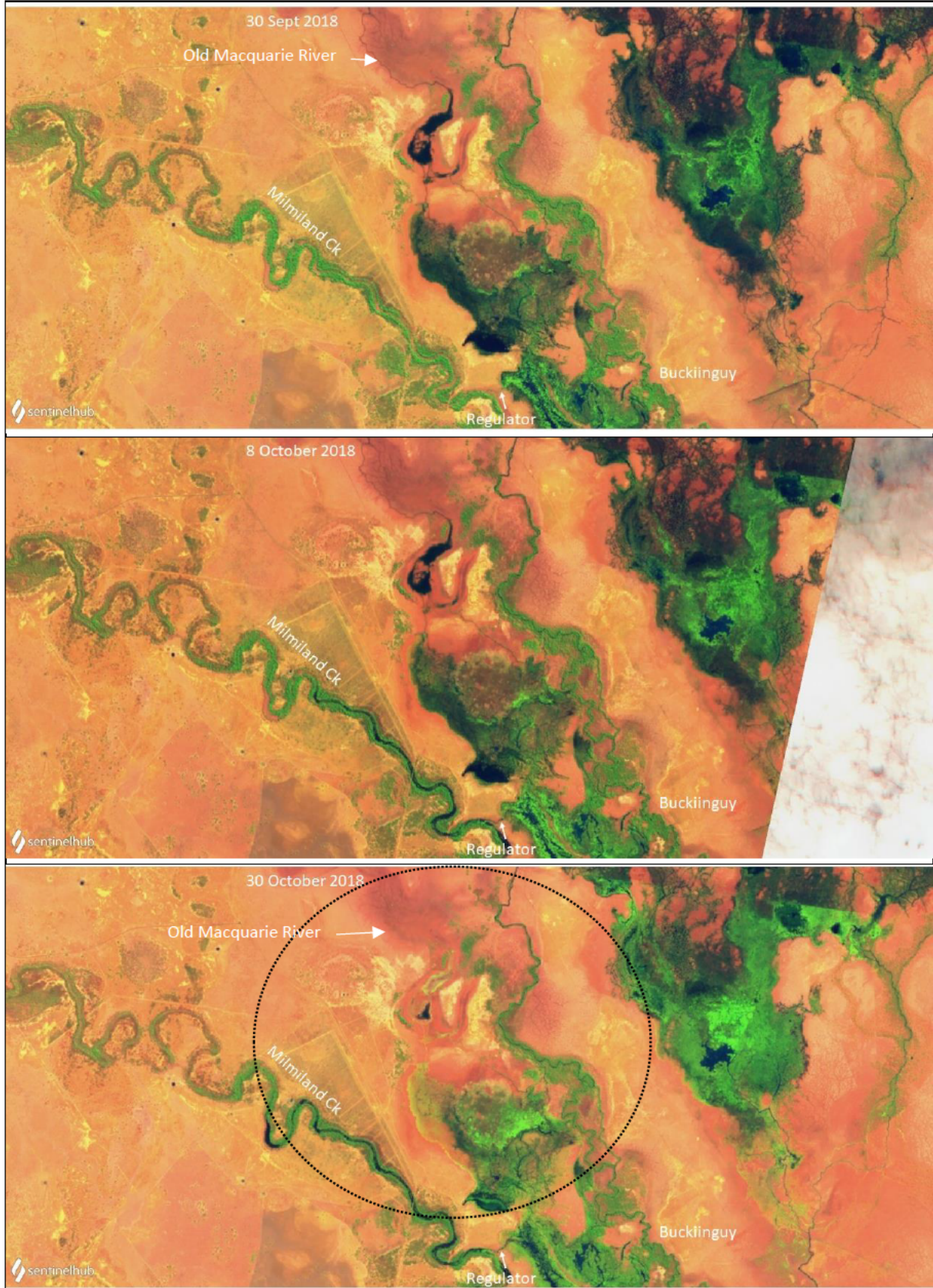
Natural Resource Access Regulator, it currently does not have rules or guidelines that this regulator can use to assess whether the take of water for basic landholder rights is reasonable in terms of the volume of take. The CEWH is aware that this issue has been raised by the NRC, including in the Barwon–Darling WSP review. The CEWH suggests that these guidelines need to be finalised by NSW as a matter of priority. The CEWH notes that the NRC recommendations on the Barwon–Darling WSP includes a recommendation that these guidelines are in effect by the end of 2020.

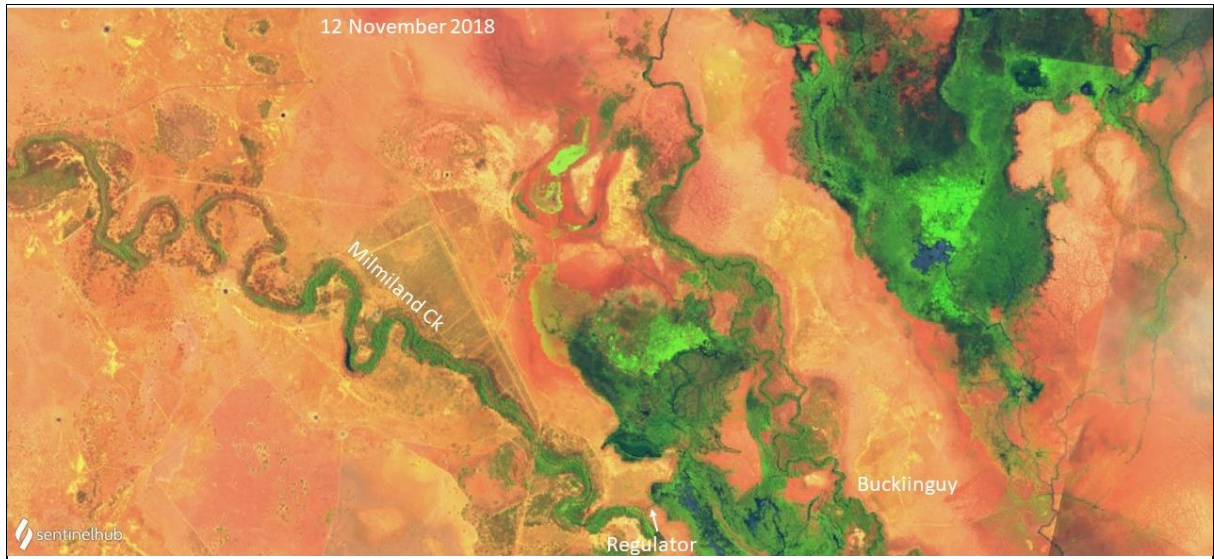
As part of clarifying and confirming the quantum of critical human water needs, and giving the community confidence, it is important that NSW completes and releases Reasonable Use Guidelines (s.336 of the Water Management Act 2000) as soon as possible.

Recommendation 14: *That the NRC recommends that DPIE Water complete and publish ‘reasonable use guidelines’ for the take of stock and domestic water and basic landholder rights as a matter of priority, to support the work undertaken by the NSW Natural Resources Access Regulator.*

Attachment A

Satellite images of inundation of Buckiinguy Swamp, Old Macquarie Channel and parts of the southern Marshes as the Milmiland regulator was opened to allow flows down Milmiland Creek. 30 September; 8 October; 30 October; 15 November 2018. Source: Sentinel playground.





End of Draft

