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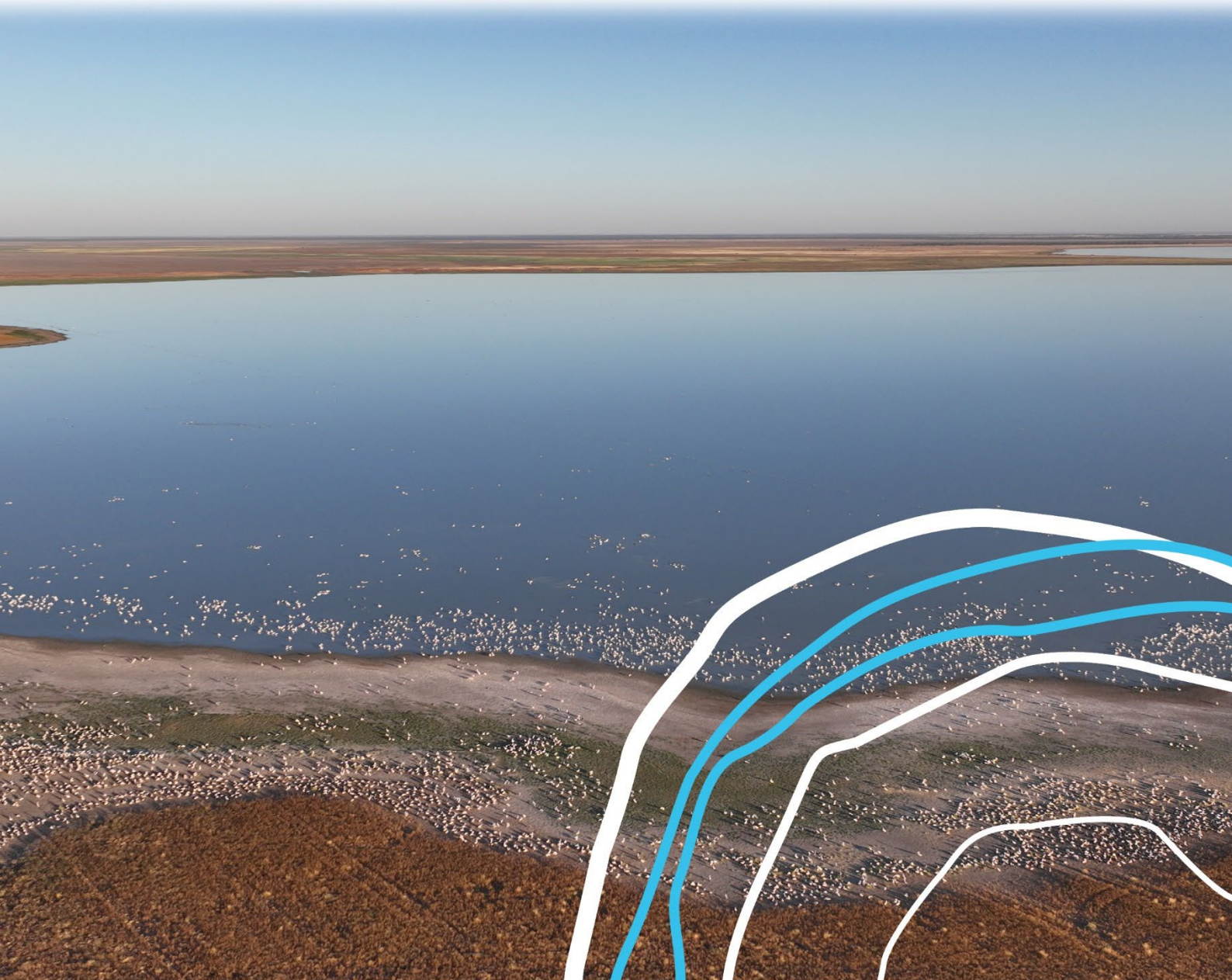
Commonwealth Environmental Water Holder



Water Management Plan

2023-24

Chapter 3 – Condamine–Balonne Valley Water Plan



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Acknowledgement of Country

Our department recognises the First Peoples of this nation and their ongoing connection to culture and country. We acknowledge Aboriginal and Torres Strait Islander Peoples as the Traditional Owners, Custodians and Lore Keepers of the world's oldest living culture and pay respects to their Elders past, and present.

Acknowledgement of First Nations people

The Commonwealth Environmental Water Holder (CEWH) and their staff acknowledge the First Nations communities of the Murray–Darling Basin and pay respect to their Elders past and present.

We acknowledge First Nations people as the Traditional Owners and custodians of the land, water and sky country across the Basin. We recognise the intrinsic connection of First Nations people to Country, and we value their enduring cultural, social, environmental, spiritual, and economic connection to the rivers, wetlands, and floodplains of the Basin.

Over millennia, First Nations people have shaped, managed, and cared for the land and waterways that sustain them. The CEWH values the relationships we currently have with First Nations people and is continuously building relationships to understand how we can empower and support First Nations people to care for Country. The CEWH will continue to work with First Nations people to identify ways to support cultural values alongside environmental outcomes with Commonwealth environmental water.

We value the ongoing contribution that First Nations people make to the planning and delivery of environmental water. We acknowledge this contribution is made largely through frameworks and processes that have not been determined, or endorsed, by First Nations people. More can be done to increase First Nations people’s involvement and enable progress towards self-determination within and beyond the environmental watering program. We will continue to support and enable this where we can.

There are more than 40 First Nations in the Basin with many distinct cultures and practices.

First Nations of the Condamine-Balonne include Barunggam, Bidjara, Bigambul, Euahlayi, Gomeroi/Kamilaroi, Giabel, Githabul, Gunggari, Guwamu/Kooma, Jarowair, Kambuwal, Mandandanji, Murrawarri, and Wakka Wakka Nations (MDBA 2021). The CEWH respectfully acknowledges these Nations, their Elders past and present, as the Traditional Custodians of the land on which this chapter is focussed.

We embrace the spirit of reconciliation, working towards equity and equality for First Nations people.

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1 Condamine–Balonne Valley Water Plan

An overview of the Condamine-Balonne Valley including the Traditional Owners, key environmental values and sites, environmental objectives and environmental water delivery partners is provided on the [CEWH website](#).

1.1 Recent conditions and seasonal outlook

1.1.1 Recent conditions and environmental water use

The Condamine–Balonne Valley experienced extreme drought conditions between 2017 and 2020. Extended periods of low, or no flows reduced the extent and quality of refuges and likely impacted on the condition of aquatic communities throughout these rivers. Widespread rainfall and river flows eased conditions from early 2020. Additional water was secured in the Lower Balonne in early 2020, through a pilot event-based mechanism (EBM) which delivered water to the Narran Lakes.

Wet conditions continued throughout much of 2021 and 2022, resulting in flooding across most of the catchment and most storages spilling. The largest ever volume of Commonwealth environmental water in the northern Murray–Darling Basin was used in the Condamine-Balonne Valley during 2021–22, with almost 317 gigalitres accounted for at St George and over 127 gigalitres accounted for at the NSW–Queensland border.

Conditions remained very wet throughout the first half of 2022–23, with widespread rainfall and significant river flows. The Condamine–Balonne Valley experienced a particularly wet spring, with some areas receiving their highest recorded rainfalls, resulting in major flooding. Water storages remained full or spilling over the first half of the water year.

Conditions rapidly turned hot and dry in early summer 2022–23 with cease-to-flow conditions occurring in the downstream reaches of the Condamine–Balonne Valley. In response to the drying conditions, the Commonwealth secured an additional 6.5 gigalitres of water in the Lower Balonne in early 2023 through a release from a private storage, known as an event-based mechanism. An event-based mechanism (EBM) is an innovative way to get more water to where and when it is needed. This extra water complements or tops-up the water the CEWH owns on a permanent basis. This water supported large-scale waterbird breeding at Narran Lakes, which occurred in 2022–23 for only the second time in 10 years. Water storage levels declined over summer and autumn 2022–23. As of 1 July 2023, Beardmore Dam was at 16% capacity and Jack Taylor Weir was at 60% capacity.

The Commonwealth started the 2022–23 water year with 171.96 gigalitres of environmental water available in the Lower Balonne, including 68.32 gigalitres in river access licences and 103.62 gigalitres in overland flow licences. Flow harvesting was announced in the Lower Balonne for 114 days between July and December 2022. The Narran flow harvesting rule was in place for 9 days, reducing the maximum daily rate of take for each water harvesting announcement to 90% while the rule was in place. The Commonwealth accounted for 111.28 GL of environmental water in the Lower Balonne in 2022–23, made up of 68.32 gigalitres of river

licences which were fully used, and 42.96 gigalitres in overland flow licences which left an estimated 60.68 gigalitres remaining at the end of the water year. 1,537 gigalitres of total flows including all types of water flowed past St George in 2022–23. The Commonwealth’s unregulated entitlement in the Nebine Creek was not triggered in 2022–23.

An estimated 79.4 gigalitres of Commonwealth’s environmental water in the Condamine–Balonne passed the Queensland–NSW border between July and November 2022, mostly in the Culgoa and Narran Rivers. Flows from the Culgoa contributed to flows downstream in the Darling River and ultimately into the Murray River.

Flow rates and total flow volumes for various parts of the lower Balonne network are shown (Table CB1). This water will help build on the environmental benefits achieved from the previous years flow events.

Table CB1 Maximum flow rate, duration and total flow volume at key flow gauges across the Lower Balonne distributaries, 1 July 2022 to June 2023

Site	Description	Maximum flow rate (ML/d)	Flow duration (days)	Total flow volume (ML)
Wilby Wilby (Narran River)	Located mid-way between the Queensland–NSW border and the Narran Lake Nature Reserve.	7,811	232	378,351
Narran Park (Narran River)	Located on the western boundary of the Narran Lake Nature Reserve.	4,194	215	279,900
Brenda (Culgoa River)	Located near the Queensland–NSW border.	30,768	278	1,030,762
Downstream of Collierina (Culgoa River)	Downstream of where Nebine and Birrie systems connect to the Culgoa River. The most downstream gauge.	19,055	279	1,122,504
Bokhara (Bokhara River)	The most downstream gauge.	2,077	223	129,465

a Data from WaterNSW (2023).

Learn more about previous [Commonwealth environmental water use in the Condamine–Balonne Valley](#).

1.1.2 Seasonal outlook

The La Niña climate pattern that has been bringing wet weather ended in the Pacific Ocean in mid-March 2023, with climate indicators returning to neutral levels.

According to the Bureau of Meteorology outlook, the forecast across the Condamine–Balonne Valley is for well below average rainfall between June and September (BoM 2023b, c).

Maximum temperatures across the Condamine–Balonne Valley are forecast to be well above average between June and September (BoM 2023d, e).

This forecast indicates that dry conditions may again be returning to the Condamine–Balonne Valley.

1.1.3 Water availability

Commonwealth environmental water holdings in the Condamine–Balonne system largely consist of unregulated entitlements. As such, the availability of environmental water in the Condamine–Balonne depends on the nature of flow events that occur. Unregulated entitlements provide opportunistic access to unregulated river flows and overland flows when water resource plan rules are triggered and a period of water harvesting access is announced. Each entitlement will contribute to restoring flows reflecting its flow access windows, take rates and location. Daily, instantaneous, annual or multi-year limits cap overall diversions in any given year or flow event, and likewise the flow contributions that can be attributed to unregulated Commonwealth entitlements.

1.1.4 First Nations environmental watering objectives

The CEWH is committed to learning from First Nations people to understand how First Nations people’s voices, values and knowledge can be considered in environmental water planning decisions (see chapter 1 of the [Commonwealth Environmental Water Holder Water Management Plan 2023–24](#)). In the Condamine–Balonne Valley the CEWH and their staff have been building relationships with First Nations people to work towards developing a work program. Over the next year the CEWH will work with First Nations people to understand what a work program could look like to ensure that First Nations people and representative groups actively participate in the planning and management of environmental flows in ways that they determine.

1.1.5 Environmental demands

The environmental water demands for assets in the Condamine–Balonne Valley in 2023–24 are shown in Table CB2. The capacity to contribute to these environmental demands is contingent on the Commonwealth licences being triggered by natural flow events.

Table CB2 Environmental demands, Condamine–Balonne Valley, 2023–24

Environmental assets	Target values	Indicative demand (for all sources of water in the system)			2023–24		Implications for future demand
		Flow/volume	Required frequency (maximum dry interval)	Watering history (from all sources of water)	Environmental demand for water (all sources)	Potential Commonwealth environmental water contribution	Likely urgency of demand in 2024–25 if watering occurred as planned in 2023–24
Lower Balonne River channels (Culgoa River, Narran River and inner distributary channels) and Barwon–Darling <ul style="list-style-type: none"> • Drought refuge habitat • Native fish habitat, dispersal and spawning • Aquatic invertebrate species 	Drought refuge habitat. Connectivity. Water quality. Fish maintenance and survival (all groups).	Very low flows: Decreasing length of cease-to-flow periods to protect waterhole persistence and/or water quality: Any flow greater than 1 ML/day for a minimum of 1 day for the following gauges. <ul style="list-style-type: none"> • Culgoa River at Brenda. • Briarie Creek at Woolerbilla-Hebel. • Ballandool River at Hebel-Bollon Road. • Bokhara River at Hebel GS. • Narran River at Angledool 2. 	Annually. (max. interval 1 year).	Since 2011–12 flow requirements for the maintenance of drought refuges in the 4 rivers have been met in most years, including 2022–23. Water is required annually to replenish refugial waterholes therefore this demand remains high in 2023–24.	High	A high priority for use of Commonwealth environmental water under dry to very dry conditions to increase system connectivity and refresh critical fish refuge. May be met by other water in the system,	High
	Longitudinal connectivity (Culgoa River). Fish movement, productivity and condition.	Small fresh: <ul style="list-style-type: none"> • Culgoa River at Brenda: greater than 1,000 ML/day for 7 days. 	8 in 10 years. (max. interval 3 years).	This demand has been met in 7 out of the past 10 years, including in 2022–23. This demand remains high in 2023–24 as the required frequency has not yet been met.	High	A high priority for use of Commonwealth environmental water under dry to moderate conditions and a moderate priority under moderate to wet conditions.	Moderate-High
	Fish movement, productivity and condition. Fish spawning and recruitment.	Large fresh: <ul style="list-style-type: none"> • Narran River at Wilby Wilby: 1,700 ML/day for 14 days; August to May. 	4 to 6 in 10 years. (max. interval 5 years).	This demand has been met in 3 out of the past 10 years, most recently in 2022–23. This demand remains high in 2023–24 as the required frequency has not yet been met.	High	A high priority for use of Commonwealth environmental water under dry to moderate conditions and a moderate priority under moderate to wet conditions.	Moderate-High
		Large fresh: <ul style="list-style-type: none"> • Culgoa River at Brenda: 3,500 ML/day for 14 days; August to May. 	4 to 6 in 10 years. (max. interval 2 years).	This demand has been met in 4 of the past 10 years, most recently in 2022–23. Prior to 2019–20, the demand had not been met in 6 years. The demand in 2023–24 is assessed as moderate in 2023–24 as the required frequency has only just been met, and further watering is required to provide opportunities for the dispersal and recruitment of native fish species and to maintain ecosystem health and function.	Moderate	A moderate priority for use of Commonwealth environmental water under dry to moderate conditions and a low priority under moderate to wet conditions.	Moderate
Lower Balonne floodplain <ul style="list-style-type: none"> • Riparian vegetation 	Connectivity with the riparian zone.	Overbank flow: <ul style="list-style-type: none"> • Culgoa River at Brenda: 9,200 ML/day for 12 days. 	3 to 5 in 10 years. (max. interval 9 years).	This demand has been met in 2 out of the past 10 years, most recently in 2021–22 and 2022–23. This demand remains high in 2023–24 as the required frequency has not been met. This demand is required in 2023–24 to maintain ecosystem health and function, including to support the recovery and maintain condition of river red gum, ephemeral wetlands and lignum communities.	High	A high priority for use of Commonwealth environmental water under dry to moderate conditions and a moderate priority under moderate to wet conditions. Benefit of supplying additional Commonwealth environmental water may be limited.	Moderate - High
	Connectivity with the inner floodplain.	Overbank flow: <ul style="list-style-type: none"> • Culgoa River at Brenda: 15,000 ML/day for 10 days. 	2 to 4 in 10 years. (max. interval 11 years).	This demand has been met in 2 out of the past 10 years, including most recently in 2022–23. The demand in 2023–24 is assessed as moderate, as prior to 2021–22 the demand had not been met in 10 years and follow up inundation is required to maintain ecosystem health and function.	Moderate	Low priority for use of Commonwealth environmental water. Benefit of supplying additional Commonwealth environmental water would be negligible.	Moderate
	Connectivity with the mid floodplain.	Overbank flow: <ul style="list-style-type: none"> • Culgoa River at Brenda: 24,500 ML/day for 7 days. 	1 to 2 in 10 years. (max. interval 11 years).	This demand has been met in 2 out of the past 10 years, including most recently in 2022–23. The demand in 2023–24 is assessed as moderate, as prior to 2021–22 the demand had not been met in 10 years and follow up inundation is required to maintain ecosystem health and function.	Moderate	Low priority for use of Commonwealth environmental water. Benefit of supplying additional Commonwealth environmental water would be negligible.	Low
	Connectivity with outer floodplain.	Overbank flow: <ul style="list-style-type: none"> • Culgoa River at Brenda: 38,000 ML/day for 6 days. 	0.5 to 1 in 10 years. (max. interval 23 years).	This demand has been met in 1 out of the past 10 years, in 2021–22. The demand is assessed as low in 2023–24, as the upper range of the required frequency has been met.	Low	Low priority for use of Commonwealth environmental water. Benefit of supplying	Low

Environmental assets	Target values	Indicative demand (for all sources of water in the system)			2023–24		Implications for future demand
		Flow/volume	Required frequency (maximum dry interval)	Watering history (from all sources of water)	Environmental demand for water (all sources)	Potential Commonwealth environmental water contribution	Likely urgency of demand in 2024–25 if watering occurred as planned in 2023–24
						additional Commonwealth environmental water would be negligible.	
Narran Lakes <ul style="list-style-type: none"> • Areas of Ramsar listed wetlands • Waterbird breeding and foraging habitat • Riparian vegetation • Native fish habitat • Drought refuge habitat 	Waterbird breeding habitat in northern lakes (Ramsar site).	Narran River at Wilby Wilby: cumulative volume of 25 GL over 60 days; any time.	7 to 10 in 10 years. (max. interval 2 years).	This demand has been met in 4 out of the past 10 years including most recently in 2022–23. While the demand has been met in four sequential years, it remains a high demand in 2023–24 as the required frequency has not been met and habitat is continuing to recover.	High	A high priority for use of Commonwealth environmental water under dry to moderate conditions and a moderate priority under moderate to wet conditions. Given recent wet conditions, this demand is considered a lower priority for an event-based mechanism in 2023–24.	High
	Waterbird breeding and foraging habitat northern lakes zone.	Narran River at Wilby Wilby: cumulative volume of 50 GL over 90 days; any time.	5 to 8 in 10 years. (max. interval 2 years).	This demand has been met in 3 out of the past 10 years, most recently in 2022–23. While the demand has been met in two sequential years, it remains a high demand in 2023–24 as the required frequency has not been met and habitat is continuing to recover.	High	A high priority for use of Commonwealth environmental water under dry to moderate conditions and a moderate priority under moderate to wet conditions. Given recent wet conditions, this demand is considered a lower priority for an event-based mechanism in 2023–24.	High
	Trigger and maintain large scale colonial waterbird breeding.	Narran River at Wilby Wilby: cumulative volume of 154 GL over 90 days; any time.	2 to 3 in 10 years. (max. interval 6 years).	This flow demand has been met in 2 out of the past 10 years, most recently in 2022–23. While the demand has been met in two sequential years, it remains a high demand in 2023–24 as the upper range of the required frequency has not yet been met, and the demand was not met before 2020–21.	High	A moderate priority for use of Commonwealth environmental water under dry to moderate conditions and a moderate priority under moderate to wet conditions. Waterbird populations in the Basin have been steadily declining. Whilst large-scale waterbird breeding has occurred over recent water years, this demand is still considered a priority for an event-based mechanism in 2023–24, to help ensure completion of a waterbird breeding, should one occur.	High
	Water all floodplain and wetland habitat in Narran Lakes complex, initiate waterbird breeding, provide long-term refuge.	Narran River at Wilby Wilby: cumulative volume of 250 GL over 180 days; any time.	1 in 10 years. (max. interval 6 years).	This demand has been met in 2 out of the past 10 years, including most recently in 2022–23. The demand in 2023–24 has been assessed as low as the required frequency has been met.	Low	A low priority for use of Commonwealth environmental water under all conditions. This demand is unlikely to be considered a priority for an event-based mechanism in 2023–24.	Low




Note: All watering history sourced from NSW Department of Planning, Industry and Environment and Queensland partner agencies, data from the following gauges (WaterNSW 2023; DRDMW 2023): 422209A – Bokhara River at Hebel GS, 422211A – Briarie River at Woolerbillia-Hebel Road, 422015 – Culgoa at Brenda, 422016 – Narran at Wilby Wilby, 422207A – Ballandool River at Hebel-Bollon Road, 422030 – Narran River at Angledool 2.

Key

Potential watering in 2023–24

- High priority for Commonwealth environmental watering (likely to receive water even under low water availability)
- Secondary priority for Commonwealth environmental watering (watering to occur only if natural trigger is met, or under moderate – high water resource availability); or water demand likely to be met via other means
- Low priority for Commonwealth environmental watering (under high – very high water resource availability); or unable to provide water because of constraints or insufficient water

Environmental demands (demand is considered at a generalised scale; there may be specific requirements that are more or less urgent within the flow regime)

-  High to critical demand for water (needed in that particular year or urgent in that particular year to manage risk of irretrievable loss or damage)
-  Moderate demand for water (water needed in that particular year, the next year, or both)
-  Low demand for water (water generally not needed in that particular year)

1.2 Water delivery in 2023–24

Unregulated entitlements provide opportunistic access to river flows and overland flows when water levels exceed trigger values at certain locations, as specified in the entitlement conditions. Each triggered Commonwealth environmental water entitlement leaves water in the river which would otherwise be extracted. This contributes to river connectivity and restoring natural flows. The location and size of the event will influence which environmental demands Commonwealth environmental water contributes to (Table CB2).

Held environmental water is accounted at the Queensland – NSW border under cross-border accounting arrangements. Qld Department of Regional Development, Manufacturing and Water (DRDMW) will continue to use the accounting procedure and protocols to account for the volume of Commonwealth environmental water reaching the border.

The Commonwealth’s water harvesting allocations will contribute to all flows during water harvesting periods, and thus are able to contribute to all environmental demands listed in Table CB2. The characteristics of the overland flow licences are such that in wetter years there will be a higher yield of water against these overland flow licences than in drier years. These licences will generally contribute to meeting fish recruitment, migration and dispersal, Lower Balonne floodplain and Narran Lakes demands during wetter years.

If a large-scale waterbird breeding event occurred in 2023–24, the CEWH would consider implementing an event-based mechanism to maintain water levels and ensure completion of the waterbird breeding event. Meeting the waterbird foraging habitat demands in Table CB2 is a lower priority for a no take event-based mechanism in 2023–24 due to the recent wet conditions.

1.3 Monitoring and lessons learned

1.3.1 Monitoring

The Murray-Darling Basin Authority (native fish), Queensland and NSW agencies, including Queensland Department of Regional Development, Manufacturing and Water and Department of Environment and Science (flow, hydrology, water quality, native fish) and NSW Department of Planning and Environment (vegetation, waterbirds and other animals), NSW Department of Primary Industries – Fisheries (native fish), and WaterNSW (hydrology and flow delivery data) all perform monitoring functions in the Condamine–Balonne Valley. The CEWH is also funding several short-term intervention monitoring projects to evaluate the environmental responses of native fish, waterbirds and vegetation.

Learn more about [monitoring activities funded by the CEWH in the Condamine–Balonne Valley](#).

1.3.2 Lessons learned

Outcomes from monitoring and lessons learned in previous years are a critical component for the effective and efficient use of Commonwealth environmental water. These learnings are incorporated into the way environmental water is planned and delivered (through decision making processes including advisory groups, water use plans and water use minutes). This includes influencing the targeted areas and species for environmental water; and the timing, magnitude and duration of environmental flows.

Key findings from fish, vegetation and flow monitoring in the Condamine–Balonne Valley are summarised in Table CB3.

Table CB3 Key lessons learned from monitoring in the Condamine–Balonne Valley

Theme	Lessons learned
Native fish and aquatic invertebrates	<ul style="list-style-type: none"> • Only 10% of the river channel network in the Condamine–Balonne retained water at the peak of the 2018 to 2020 drought. Native fish moved from the few remaining refuges into previously dry waterholes during the autumn 2020 flow. Monitoring is helping to identify river segments where drought poses the greatest risks to fish population viability and the barriers that pose the greatest threat to post-drought recovery. Further monitoring will help assess and prioritise the management of risks to fish population viability from drought and fragmentation by barriers in any non-perennial river setting (Marshall & Lobegeiger 2020; Marshall & Lobegeiger 2021). • Fish detected in the Condamine-Balonne included threatened species (Murray Cod, Silver perch and olive perchlet) as well as Bony bream, golden perch, Murray–Darling rainbowfish, Australian smelt, spangled perch, carp gudgeon, Hyrtl’s tandan and unspecked hardyhead as well as the invasive species common carp, goldfish and gambusia (Marshall et al. 2022). The populations were heavily dominated by bony bream, golden perch and common carp. • It appears that following drought, young of year fish recruit more successfully in newly established or rewetted habitats than in persistent habitat that survived drought. This may be due to less predation pressure from adult fish in ephemeral waterholes (Marshall et al. 2022). • Most fish seemed to remain in their local environments, with around 10% identified as moving in a wider radius. Only 8% of the golden perch sampled had evidence of lifetime movements, with the majority of these being born elsewhere and moving to the site after the drought. Fish movement was not strongly influenced by historical drowning out of barriers to fish passage (i.e. weirs) or the size of peak-drought waterholes. • It appears that the severe drought impacted regional fish groups by decimating both local and overall metapopulation abundances. While it is encouraging that site abundance doubled between the first and second year after the breaking of the drought, there is still a large deficit in local population abundances. Local post-drought spawning, and recruitment appears to be the dominant resilience process supporting drought recovery of local and regional fish populations. • Other work has identified the Condamine–Balonne as a source population for golden perch in the northern Murray–Darling Basin and the Murray–Darling Basin as a whole. Monitoring shows that there are large numbers of golden perch juveniles and young-of-year in the Condamine–Balonne in response to multiple flow events since early 2020 (Greg Ringwood, [Murray–Darling Basin Authority] 2022, pers. comm, May 2022). Connection flows between the Condamine–Balonne and the downstream Barwon–Darling and other northern tributaries provide opportunities for golden perch to move both up and downstream (Stuart 2020).
Vegetation	<ul style="list-style-type: none"> • The CEWH funded a short-term intervention monitoring (STIM) project on vegetation condition at Narran Lakes from early 2020 to December 2021. Monitoring assessed changes in vegetation condition pre-flows (March 2020), post inundation (September 2020) and following two additional inundation events (December 2021) (Vincent, Bowen & Southwell 2022). • While improvements in community condition and tree stand condition were observed, findings were mixed (Vincent, Bowen & Southwell 2022). Generally, sites that received inundation improved in condition more than those that did not; and sites that received longer duration improved in condition more than sites that received shorter duration. Sites that were not inundated and relied on rainfall only displayed only marginal improvements, no improvements at all or in some cases declined in vegetation condition. In some cases, the water arrived too late which was evidenced by individual mortality in all four dominant woody species that had succumbed to the drought (Vincent, Bowen & Southwell 2022). • Findings from this study indicate that the inundation events received throughout 2020–21 improved vegetation condition, however, wetland and flood dependant vegetation in Narran Lake Nature Reserve appears to still be in a recovery phase. Further flows are required to progress vegetation condition beyond recovery (Vincent, Bowen & Southwell 2022). • The CEWH is funding a new vegetation monitoring project at Narran Lakes to better understand medium and long-term response to flows and drying at the Lakes, in collaboration with the Narran Lakes Joint Management Committee.
Connectivity	<ul style="list-style-type: none"> • The Condamine–Balonne, including the Nebine Creek, provide important tributary inflows to the Barwon–Darling during unregulated flow events (WaterNSW 2023). Cross-border

Theme	Lessons learned
Waterbirds	<p>accounting arrangements developed by Queensland and NSW with input from the Commonwealth are being used to track environmental water from the Queensland Condamine–Balonne into the NSW downstream to the Barwon–Darling. Active management arrangements in NSW will also provide better protection of the Commonwealth’s environmental water in the Barwon–Darling from water flowing from the Condamine–Balonne and other unregulated Barwon–Darling tributaries.</p> <ul style="list-style-type: none"> • Inundation analysis at Narran Lakes by the MDBA identified that in 2022-23 inundation of the Ramsar area in the Narran Lakes Nature Reserve peaked at around 6,000 hectares or 71% of the Ramsar area in September 2022, including all waterbird breeding and foraging habitat. • There are several Northern Basin toolkit projects focused on improving connectivity and fish passage in the Condamine–Balonne Valley, including improving flows through the bifurcation weirs in the middle streams and pump screening. <hr/> <ul style="list-style-type: none"> • Waterbird surveys have identified that Narran supports threatened and migratory bird species including black necked stalk, sandpipers, bar-tailed godwit, freckled duck, blue-billed duck and great crested grebe and 2 rare migratory species. Over 55 species of waterbirds were observed at Narran Lakes between 2020 and 2023. • Waterbird monitoring in summer 2022-23 identified 2 colony sites at the Narran Lakes Nature Reserve, in locations similar to those areas used in previous nesting events. This was the only the second time in 10 years that waterbirds have bred at Narran Lakes. Straw-necked ibis nest counts across both colonies in the 2022-23 season were approximately 7,334, in addition to white ibis, glossy ibis, royal spoonbills, egrets and cormorants (Brandis et al. 2023). Australian pelicans also nested at Narran Lake in 2022-23 across two colonies for the first time since 1999. Nest counts at the black box colony to March 2023 was around 18,641 nests, which was amongst the largest in the Basin during 2022-23. • When compared to previous straw-necked ibis colonies at Narran Lakes, this nesting event was relatively small for the volume of water received and the inundation extent and duration. This is the same finding that was made in the 2021-22 breeding season (Brandis et al. 2022; 2023). Like the 2022 ibis breeding event, the density of nesting was low with very dispersed clumps throughout the colony area, and clump sizes were relatively small when compared to previous colonies at Narran and with other colony sites. This may be due to the quality or health of the lignum, with observations suggesting that lignum may not have been very structurally robust which may have influenced nest building decisions by birds (Brandis et al. 2023). • Reproductive success rates were not measured during this breeding event due to restricted site access in the early stages of nesting. However, there were no observations of disease or blue-green algae, indicating that water quality was good. • Water depth at nests was variable, with water levels peaking at around 2.6 m at the Back Lake gauge in December 2022 before flows into Narran Lakes ceased in mid-January 2023. In response to the rapidly drying conditions the CEWH arranged for the release of 6.5 GL of water from a water holder on the Narran River through an event-based mechanism. Water began to reach the Narran Lakes Nature Reserve in early March to maintain wetland inundation and provide ongoing habitat for recently fledged birds. • Satellite transmitters were deployed to track the movement of straw-necked ibis and royal spoonbills at Narran Lakes in March 2022. Information from this tracking has identified different movement and foraging patterns by the two species, with royal spoonbills moving relatively large distance to forage, while straw-necked ibis tended to stick closer to the Narran Lakes area. Birds tagged at Narran moved to areas west of the Paroo, near Narrabri, near Surat in Queensland, Lightning Ridge, as well as moving south to the Macquarie Marshes. Birds tagged at Macquarie Marshes also moved up to the Condamine River (Heather McGinness [CSIRO], 2022, pers. comm, June 2022). <hr/>
Water quality	<ul style="list-style-type: none"> • As part of preparation for the release from private storage event-based mechanism in 2022-23, the CEWH funded pre- and post-release water quality monitoring in the Narran River near Dirranbandi-Hebel. This monitoring was required to comply with the Queensland code of practice for releases from private storages (DEHP 2016). Results from this monitoring will be used to inform planning for a release from storage event-based mechanism if pursued in 2023–24.

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