



Office of
Environment
& Heritage

Lachlan Water Resource Plan Area

**Statement of annual environmental watering
priorities 2016–17**

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Purpose of this statement

This statement meets the New South Wales Government's obligations to outline the annual environmental watering priorities for the Lachlan Water Resource Plan area (WRP area) as set out in Part 4, Division 4 of Chapter 8: Environmental watering plan of the Murray–Darling Basin Plan 2012 (MDBA 2012a).

The guidelines for how to determine priorities for applying environmental water (MDBA 2012b) have been used to identify the environmental watering priorities for 2016–17 for the Lachlan WRP area. The priorities reported here are derived from the Lachlan Valley Annual Environmental Watering Plan 2016–17.

Lachlan Water Resource Plan Area description

The Lachlan WRP area, located in central NSW, is 90,000 square kilometres in area (Map 1). Bordered by the Murrumbidgee WRP area to the south and the Darling River and Macquarie–Cudgegong WRP area to the north, the river travels about 1400 kilometres before terminating in Great Cumbung Swamp. The Lachlan WRP area supports a variety of wetlands, many of which are dominated by river red gum, black box and lignum.

Consultation

In NSW, environmental water advisory groups are the primary vehicles for stakeholder consultation on environmental water planning for a particular WRP area. The Lachlan Environmental Water Advisory Group (LEWAG) (formerly known as the Lachlan Riverine Working Group) provides advice on the development of the Lachlan Annual Environmental Watering Plan.

The LEWAG has reviewed and endorsed the annual environmental watering priorities for the Lachlan WRP area. The Office of Environment and Heritage (OEH) website has details of the [objectives and membership of the LEWAG](#).

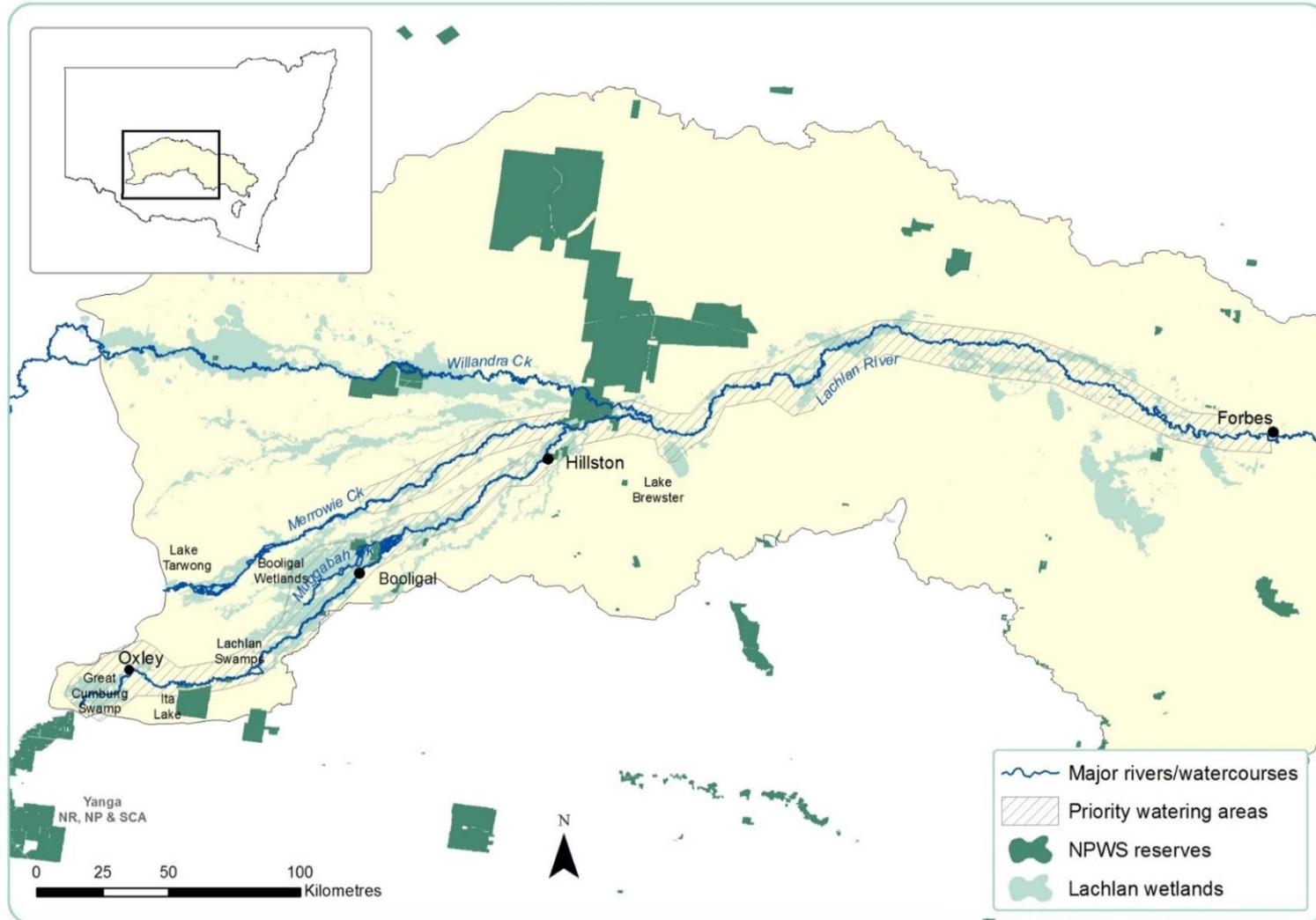
Preparation of this statement also involved consultation with the Commonwealth Environmental Water Office.

Antecedent conditions: previous watering and condition of assets

During most of the 2015–16 water year, below-average to average rainfall fell across the Lachlan WRP area. The lower catchment experienced good rainfalls in autumn/early winter, although below-average conditions were experienced over most of the year. The upper catchment experienced sufficient inflows in July and August 2015 to provide general-security available water determinations (reaching 25%) and to trigger a translucent release of 72 gigalitres in September. In the Lachlan translucent releases allow a proportion of inflow pulses to pass down the river to reflect natural inflow conditions. Following that inflow period, conditions in the Wyangala Dam catchment were very dry throughout the summer and autumn months.

Domestic and stock replenishment flows to effluent creeks for 2015 were completed in early spring, and these were followed closely by translucent flows.

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Map 1: Annual environmental watering priority areas, Lachlan WRP area, 2016–17

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The condition of the Lachlan wetlands varies considerably across the WRP area. Although the health of the lower Lachlan floodplain, in general, has improved markedly compared with that experienced during the Millennium drought, there are areas where floodplain vegetation in the early stages of recovery are beginning to show signs of stress.

Overall, the antecedent conditions across all of the environmental assets in the Lachlan WRP area are considered to be dry. Table 1 summarises environmental water use in the area 2015–16.

Table 1: Lachlan environmental water releases, 2015–16

Asset	Total volume¹	Outcomes	Current condition
Lower Lachlan River, Brewster to Great Cumbung Swamp	32,078ML	The initially planned 20GL of environmental flow was suspended after 19GL had been released, to allow for passage of 72GL of translucent flow. Increased allocations enabled an additional 13GL of environmental flow to achieve more natural recession and extend inundation. The combination of flows inundated over 9000ha of the Great Cumbung Swamp. Overbank flows above Booligal filled Moon Moon Swamp, where cormorants and darters nested over the spring/summer. About one-third of creeks and flood runners, as well as Lake Waljeers in the Lower Lachlan Swamp, experienced short-term inundation.	The condition varies markedly across the lower Lachlan River and floodplain.
Merrimajeel Creek Murrumbidgil Swamp	1450ML	Environmental flows extended the duration of flows in Merrimajeel Creek and helped replenishment flows to reach Murrumbidgil swamp.	Lignum habitat along Merrimajeel Creek is in good condition. River red gum woodland vegetation in Murrumbidgil Swamp is in the early stages of recovery.
Booligal Wetlands: ibis breeding Murrumbidgil Swamp	1996ML	Ibis started trampling but did not progress to nesting. Environmental flows in combination with translucent flows inundated about 30% of the channels in Murrumbidgil Swamp. Flows in Muggabah Creek were also extended in duration and extent by environmental flows.	Lignum habitat along Merrimajeel Creek is in good condition. River red gum woodland vegetation in Murrumbidgil Swamp is in the early stages of recovery. Lignum habitat in upper Muggabah Creek is in moderate to good condition and the lower creek area is in poor to moderate condition.

Asset	Total volume ¹	Outcomes	Current condition
Noonamah – Lake Bullogal southern bell frog flow	82ML	20ha of frog refugia habitat was replenished through the peak spring to early summer period to support ongoing aquatic vegetation recovery.	Refuge sites near the recent southern bell frog recordings have stabilised or improved in condition.
Lachlan River below Brewster: perch fish flow	12,505ML	There has been no evidence of golden perch spawning, although there was evidence of substantial Murray cod spawning. Only small numbers of carp and <i>Gambusia</i> larvae were collected during monitoring, indicating that there were no adverse fish responses as a consequence of the flow.	Native fish populations in the Lachlan River are stressed. Regeneration of fringing river red gums is continuing.

¹ Interim volumes until otherwise confirmed

Forecast available water

Up to 111,982 megalitres should be available for environmental purposes during 2016–17 (Table 2). This volume will be made up of NSW and Commonwealth environmental water holdings and a Water Quality Allowance provided for by the [Water Sharing Plan](#) for the Lachlan Regulated River Water Source 2003.

Under the current dry conditions, no general security allocations are likely before the end of 2016. Median rainfall conditions would see no new allocations to the end of June 2016, but new allocations could reach 23% by the end of October 2016. Under wet conditions, additional general security allocations of 22% could be made before the end of June 2016; they could reach 83% by the end of October 2016.

The Bureau of Meteorology’s seasonal outlook indicates some potential for above-average rainfall in parts of southern Australia and below average in the far north. Warmer than average temperatures occurred in autumn.

Climate influences include a very warm Indian Ocean, a weakening El Niño and warm sea-surface temperatures surrounding much of Australia. The 2015–16 El Niño has now concluded. Recent changes in the tropical Pacific Ocean and atmosphere, combined with current climate model outlooks, suggest that the likelihood of La Niña forming later in 2016 is around 50%; the Bureau of Meteorology’s ENSO (El Niño/Southern Oscillation) Outlook is at La Niña WATCH level. La Niña is often, but not always, associated with above-average winter–spring rainfall over eastern Australia. Australia’s climate is also being influenced by record warm temperatures in the Indian Ocean. The warmth in the Indian Ocean may provide extra moisture for rain systems as they cross Australia during the southern autumn.

Climate outlooks can be viewed at the [Bureau of Meteorology website](#).

The above information in combination with the current low dam levels indicates that the forecast water availability for the Lachlan is low.

Table 2: Anticipated environmental water availability, Lachlan WRP area

Source	Maximum volume	Volume expected to be available at 1 July 2016
<i>Planned Environmental water allowances</i>		
Environmental contingency allowance	10,000ML	0ML (The Water Sharing Plan requires General Security accounts to hold >50% for an environmental contingency allowance to be allocated.)
Water quality allowance	20,000ML	20,000ML
Lake Brewster environmental contingency allowance	10,000ML	0ML (The Water Sharing Plan requires General Security accounts to hold >50% for an environmental contingency allowance to be allocated.)
Translucent releases	350,000ML	Depends on inflow triggers being reached
<i>NSW licensed adaptive environmental water holdings</i>		
High security	1795ML	1795ML
General security	36,569ML	35,440ML
Unregulated	184ML	–
<i>Commonwealth licensed adaptive environmental water holdings</i>		
High security	933ML	933ML
General security	87,856ML	53,814ML

The figures given in Table 2 have not been adjusted for possible future trade. OEH periodically trades water allocations to cover a proportion of the water-use charges associated with NSW environmental water holdings. The volume of environmental water traded in a WRP area is determined by the price in the local market and the targeted level of cost recovery. OEH manages the trade of NSW environmental water holdings on the basis of environmental water demand and trading opportunities across the Murray–Darling Basin; it also takes into account equity among WRP areas over time.

Resource availability scenario and management outcomes

The resource availability scenario is based on surface water availability and antecedent conditions (Appendix A: Table A1). The antecedent conditions are considered to be dry, with low surface water availability, moderate inflows and the possibility of continuing drying conditions. The resource availability scenario has thus been determined to be dry.

Following its consideration of the condition of assets, water availability, and climate forecasts, the LEWAG has recommended that the management outcomes for this environmental watering year should ensure that environmental assets maintain their basic functions and resilience (Appendix A: Table A2) by:

- supporting the survival and viability of threatened species and communities
- maintaining environmental assets and ecosystem functions, including by allowing drying to occur consistent with natural wetting-drying cycles
- maintaining refuges.

Annual environmental watering priorities

With a primary management outcome of ensuring that environmental assets maintain their basic functions and resilience, NSW has identified priority environmental watering actions for the 2016–17 water year (Table 3).

The current conditions of moderate dam levels and forecast low allocations mean that, although a substantial volume of adaptive environmental water is available, caution is needed to make sure that enough environmental water will be available the following watering year. This will ensure that, if drying conditions recur, water will be available to maintain critical habitats. It also provides a chance to supplement natural pulses or planned environmental water flows with the remaining adaptive environmental water.

Table 3: Lachlan watering site priorities under a dry resource availability scenario, 2016–17

Target area	Location/size	Estimated volume	Rationale, timing and duration
In-channel targets for fish breeding or passage	Lachlan River channel from Forbes to below Booligal (1000km of river channel)	Combined tributary event of 5GL up to 20GL protected from extraction and allowed to pass through the system to Booligal.	Protect significant spring/early summer tributary inflows to support fish breeding and movement. Target flows between October and February. Flows help support riparian vegetation and end-of-system flows into the terminal wetland system.
Southern bell frog at Lake Bullogal	Lake Bullogal–Noonamah (35 ha)	300ML	Southern bell frog was recently rediscovered at Lake Bullogal and nearby. Top-up of dams and wetland habitats to allow macrophytes to re-establish before spring breeding season. Episodic top-ups during spring and early summer.
Burrawang West Lagoon	Goobang Creek (100ha)	350ML	Lagoon filled from translucent/flood flows in spring 2015. Improved management now allows the lagoon to undergo draw-down/drying over the summer. Replenishment of lagoon in spring will support wetland vegetation and frog, fish and bird populations. Flows to occur in late winter/early spring.

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Target area	Location/size	Estimated volume	Rationale, timing and duration
Merrimajeel and Muggabah creeks (Booligal Wetlands)	170km of braided creek channel and flood runners	1000ML	Murrumbidgee Swamp vegetation is in the early stages of recovery and received only partial inundation in 2015. Both Lower Gum Swamp in upper Muggabah Creek and the lower Muggabah Creek area are stressed and in poor condition because of the reduced inundation regimes that are achieved under the replenishment flows provided by the Water Sharing Plan. To enable river operators to deliver flows at the best time for effective inundation and spread, NSW environmental water accounts will underwrite any additional operational losses that may occur as a result of running the creeks earlier than would occur under the normal optimal resource-efficient pattern. As a result, replenishment flows will occur in late autumn and early winter rather than in winter and early spring, as would have been the case under the current resource context.
Lake Brewster wetlands	Lake Brewster inflow wetland (300ha)	Up to 5000ML	Provide appropriate wetting and drying regimes to support re-establishment and growth of wetland plants in the constructed inflow and outflow wetlands. Action depends on the timing of completion of Lake Brewster works. Requires generally stable water levels for >4 months over late spring–summer.
<i>Contingency plans</i>			
Booligal Swamp ibis colony	Merrimajeel Creek (~200ha)	2500ML to 5000ML	Support colonial bird breeding if other flows are insufficient to maintain water levels (but only if breeding starts). Likely timing October to February.
Cuba Dam ibis colony	Merrowie Creek (~50ha to 150ha)	5000ML to 15,000ML	Support colonial bird breeding if other flows are insufficient to maintain water levels (but only if breeding starts). Likely timing October to February.
In-channel targets under dry to very dry conditions	Booligal to Oxley (300km of river channel)	Up to 3000ML	Maintain visible flow in the river to prevent fragmentation and stratification of pools. 50ML/day at Booligal for up to 60 days.

The ability to deliver environmental water is limited by system constraints, including channel capacity, the use of irrigation infrastructure, and potential third-party impacts such as the restriction of access to land or stock, or both, by landholders. Flows will be adaptively managed to integrate with other demands in the system to avoid inconvenience for landholders where possible. Where inconvenience is a risk, potentially affected landholders will be consulted and agreements sought on acceptable event management.

Individual watering events are approved and implemented via the current [NSW environmental water planning and operational framework](#).

Cooperative arrangements for water delivery

OEH is the leading environmental manager for NSW and coordinates environmental watering, with advice from the relevant environmental water advisory group in each WRP area. OEH has negotiated cooperative arrangements with the Commonwealth Environmental Water Office and WaterNSW to maximise the benefits of environmental water use in NSW.

OEH has also developed strong partnerships with Local Land Services, irrigator groups and landholders to ensure the efficient and effective delivery of environmental water. In some circumstances, this may include the use of private infrastructure to water wetland targets, as well as cooperative changes to land management to ensure that the desired ecological responses to watering are achieved.

In the Lachlan WRP area, OEH also works with:

- Lachlan Customer Service Committee
- Lachlan Valley Water Users
- Merrowie Creek District Trust
- Muggabah/Merrimajeel and Torriganny Creeks Water Trust
- Willandra Creek Water Trust
- Booberoi Water Users.

Further documentation

Reporting on water used throughout the 2016–17 watering season will be included in OEH's *Environmental Water Use in NSW: Outcomes 2016–17* in late 2017. A number of [environmental water ecological response monitoring reports](#) funded by the Commonwealth are also available.

References

MDBA 2012a, *Basin Plan*, Murray–Darling Basin Authority, Canberra, <http://www.mdba.gov.au/basin-plan>

MDBA 2012b, *Guidelines for the method to determine priorities for applying environmental water*: Murray–Darling Basin Authority, Canberra, <http://www.mdba.gov.au/sites/default/files/archived/alterred-PBP/APBP-Ch7-Guideline.pdf>

Appendix A

Table A1: Determining the resource availability scenario

Surface water availability	Antecedent conditions				
	Very dry	Dry	Medium	Wet	Very wet
Very low	Very dry	Very dry	Dry	Dry	n/a
Low	Very dry	Dry	Dry	Moderate	Wet
Medium	Dry	Dry	Moderate	Wet	Wet
High	Dry	Moderate	Wet	Wet	Very wet
Very high	n/a	Moderate	Wet	Very wet	Very wet

Source: Modification of table in 'Guidelines for the method to determine priorities for applying environmental water' in the Murray–Darling *Basin Plan* (MDBA 2012b), using ranges for water availability and antecedent conditions rather than the percentile ranges (15 points in each band) used in the plan

Table A2: Management outcomes for each resource availability scenario

	Resource availability scenario				
	Very dry	Dry	Moderate	Wet	Very wet
	Avoid irretrievable loss of, or damage to, environmental assets	Ensure environmental assets maintain their basic functions and resilience	Maintain ecological health and resilience	Improve the health and resilience of water-dependent ecosystems	Improve the health and resilience of water-dependent ecosystems
Management outcome	Avoid critical loss of species, communities and ecosystems. Maintain critical refuges. Avoid irretrievable damage or catastrophic events. Allow drying to occur, where appropriate, but relieve severe, unnaturally prolonged dry periods.	Support the survival and viability of threatened species and communities. Maintain environmental assets and ecosystem functions, including allowing drying to occur, consistent with natural wetting-drying cycles. Maintain refuges.	Enable growth, reproduction and small-scale recruitment for a diverse range of flora and fauna. Promote connectivity of low-lying floodplains and rivers. Support medium-flow river and floodplain functions.	Enable growth, reproduction and large-scale recruitment of a diverse range of flora and fauna. Support high-flow river and floodplain functions. Promote higher floodplain–river connectivity.	Enable growth, reproduction and large-scale recruitment of a diverse range of flora and fauna. Support high-flow river and floodplain functions. Promote higher floodplain–river connectivity.

Source: Modification of table in 'Guidelines for the method to determine priorities for applying environmental water' in the Murray–Darling *Basin Plan* (MDBA 2012b).