

# Murray and Lower Darling Water Resource Plan Area

Statement of annual environmental watering priorities 2015–16

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## 1. Purpose of this statement

This statement meets the New South Wales Government's obligations to outline the annual environmental watering priorities for the Murray and Lower Darling 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 the method to determine priorities for applying environmental water (MDBA 2012b) have been used to identify the environmental watering priorities for 2015–16 for the Murray and Lower Darling WRP Area.

The priorities reported here are derived from the *Murray and Lower Darling Valleys Annual Environmental Watering Plan 2015*–16.

Environmental watering priorities may also be specified under The Living Murray (TLM) program. TLM icon sites in NSW include the Millewa Forest, Koondrook–Perricoota Forest, the eastern section of Chowilla Floodplain and the River Murray Channel. Watering of these sites is coordinated by the Murray–Darling Basin Authority (MDBA) and undertaken in conjunction with the relevant states. This document does not report in detail on TLM water and further information is available on the TLM website.

## 2. Murray and Lower Darling Water Resource Plan Area description

The Murray and Lower Darling WRP Area is located in the south of the Murray–Darling Basin and supports hydrologically and ecologically complex freshwater habitats, as well as productive agricultural industries (Map 1). The WRP area contains important ecological assets, including floodplains, ephemeral creeks and a variety of wetlands and in-stream systems, some of which are internationally and nationally recognised and provide habitat for several threatened and vulnerable fauna and flora species.

#### 3. Consultation

In NSW, environmental water advisory groups are the primary vehicle for stakeholder consultation on environmental water planning for a particular WRP area. The Murray and Lower Darling Environmental Water Advisory Group (EWAG) provides advice on the development and implementation of the NSW Murray and Lower Darling Annual Environmental Watering Plan.

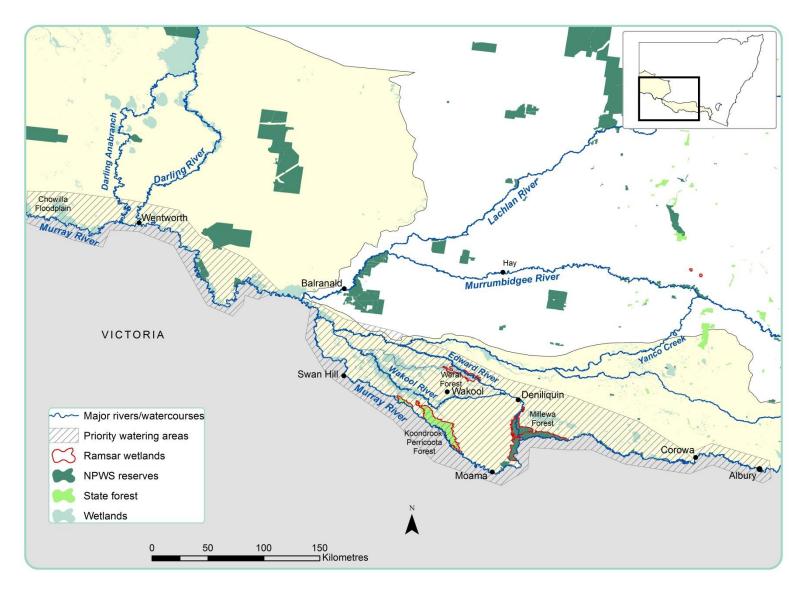
The Murray and Lower Darling EWAG has reviewed and endorsed the annual environmental watering priorities for the WRP area. The Office of Environment and Heritage (OEH) website has details of the objectives and membership of the Murray and Lower Darling EWAG.

Preparation of the statement also involved consultation with the Commonwealth Environmental Water Office (CEWO).

# 4. Antecedent conditions: previous watering and condition of assets

In 2014–15, rainfall was average to below average for most parts of the Murray–Darling Basin (Basin). As of 25 March 2015, combined water storages for the southern Basin are at 45 per cent, below that of the previous year which was 62 per cent (MDBA 2015a). Inflows from Dartmouth Dam and the Snowy scheme, in June 2015, boosted natural flows to Hume Dam, increasing storage volume to 854 ML (28 per cent capacity) (MDBA 2015b). MDBA River Operations anticipates further transfers will be required from Dartmouth Dam to Hume Dam in order to meet demands in 2015–16.

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Map 1: Annual environmental watering priority areas, Murray and Lower Darling WRP Area – 2015–16

2

Murray and Lower Darling Water Resource Plan Area: Statement of annual environmental water

priorities 2015–16

During 2014-15 approximately 79 000 ML of environmental water was delivered to a total of 14 wetlands/creeks in the Murray and Lower Darling WRP area (Table 1).

Table 1: Murray and Lower Darling environmental water releases – 2014–15

Asset	Total volume <sup>1</sup>	Outcomes	Current condition
Yallakool Creek	34 563 ML	Managed pulse releases to initiate spawning and/or movement responses in native fish populations.	Moderate condition supporting good populations of native fish and aquatic vegetation.
Koondrook- Perricoota	26 420 ML	Managed flows to commission flood enhancement works.	Moderate condition supporting good populations of native fish and aquatic vegetation.
Brechin	230 ML	Improve fringing vegetation condition, and promote the reestablishment of ground layer vegetation and aquatic plants. Maintain southern bell frog habitat and promote breeding.	Moderate condition.
Boomanoomana Swamp	420 ML	Follow up watering to improve vegetation condition.	Moderate condition.
Tuppal Creek	6220 ML	Improve water quality and promote native aquatic vegetation recruitment.	Poor to moderate condition.
Wee Wee Creek	4500 ML	Maintain/improve condition of mature fringing river red gums and black box for dependant species including the regent parrot.	Poor to moderate condition.
Bingera Creek	387 ML	Follow up watering to improve fringing vegetation condition	Drought stressed, poor condition.
Cockran and Gwynnes Creek	420 ML	Improve fringing vegetation condition, and promote the reestablishment of ground layer vegetation and aquatic plants. Maintain southern bell frog habitat and promote breeding. Manage risks from salinity and sulfidic sediment.	Poor to moderate condition due to impacts of isolation from overbank flows for 40 years or more.

Asset	Total volume <sup>1</sup>	Outcomes	Current condition
Private Property Wetlands Watering Project (Murray Irrigation – Blind Creek)	150 ML	Improve fringing vegetation condition, and promote the reestablishment of ground layer vegetation and aquatic plants. Manage risks from salinity.	Poor to moderate condition due to impacts of isolation from overbank flows.
Thule Creek Dilution	366 ML	Flow successfully diluted, reducing risk of fish kills in Thule Creek.	Moderate condition.
Lake Victoria	Lake Victoria  530 ML  Mai  con  fring  Pote  frog  bree		Moderate condition, starting to exhibit signs of stress due to lack of overbank flows.
Nampoo	200 ML	Maintain/improve condition of mature fringing river red gums. Maintain southern bell frog habitat and promote breeding.	Moderate condition, starting to exhibit signs of stress due to a lack of overbank flows.
Private Property Wetlands Watering Project (Murray Irrigation – Burswood Park Creek)	360 ML	Improve fringing vegetation condition, and promote the reestablishment of ground layer vegetation and aquatic plants. Manage risks from salinity.	Very poor condition due to impacts of isolation from overbank flows.
Colligen Creek Recession Flow	2949 ML	Use environmental water to implement a gradual recession of a rainfall rejection pulse to minimise the risk of stranding small bodied fish and crustaceans.	Moderate condition supporting good populations of native fish and aquatic vegetation.
Yarrien Creek	3628 ML	Improve fringing vegetation condition, and promote the reestablishment of ground layer vegetation and aquatic plants. Manage risks from salinity.	Poor condition due to impacts of isolation from overbank flows for over 40 years.
Thegoa Lagoon	1800 ML	Improve fringing vegetation condition, and promote the reestablishment of ground layer vegetation and aquatic plants.	Poor to moderate condition.

Asset	Total volume¹	Outcomes	Current condition
Speewa Creek	500 ML	Improve fringing vegetation condition, and promote the reestablishment of ground layer vegetation and aquatic plants.	Moderate condition, starting to exhibit signs of stress due to the lack of overbank flows.

<sup>&</sup>lt;sup>1</sup> These figures are interim until indicated otherwise.

#### 5. Forecast available water

System inflows to the River Murray system since August 2014 have been well below the long-term average and also below the average for the last 10 years, and around the 10<sup>th</sup> driest on record (DPI 2015). Summer and autumn inflow volumes have been similar to last year. As of 15 May 2015, active storage in the River Murray system is at 42 per cent of capacity, which is about 25 per cent less than the long-term average for May.

Under very dry conditions or worse, up to 30 per cent of carryover in NSW Murray general security accounts will be deliverable on 1 July 2015, while carryover in accounts will be permitted in the Lower Darling in accordance with the water sharing plan, it will not be generally deliverable (and unlikely for environmental watering), due to the current critical water shortage in that valley. Full conveyance allocation will not be available at July 2015 under drought inflow conditions. Eighty thousand megalitres will be available at 1 July and resource improvement will accrue to the target (165 000 ML) before allocations commence for general security entitlements (DPI 2015).

At the beginning of the 2015–16 water year, high security allocations are expected to start at 80 per cent in the NSW Murray and 20 per cent in the Lower Darling and general security at 0 per cent with an average of 30 per cent carryover in the Murray (Table 2). This outlook will be updated on 17 August 2015.

The NSW Office of Water has forecast that full allocations can be expected for all town water and stock and domestic access licences in the NSW Murray, however Lower Darling allocations will be 50 per cent for town water and 30 per cent for stock and domestic. Deliverability will be challenging in the Lower Darling until there is significant inflows into the Menindee Lakes System (DPI 2015).

Full allocations are expected for supplementary access licence holders, which will be available subject to announced periods of supplementary flows.

The Bureau of Meteorology (BOM) seasonal outlook has declared El Niño is current, and is having a drying impact on eastern Australia. The forecast water availability for the Murray and Lower Darling WRP Area is considered to be dry. The climate outlook can be viewed at the BOM website.

Table 2: Anticipated environmental water availability – Murray and Lower Darling WRP Area

		Volume expected to be available at				
Account	Maximum volume	1 July 2015				
Environmental water allowanc	Environmental water allowances					
Barmah–Millewa Environmental Water Allowance	700 000 ML	358 000 ML (170 GL NSW; 188 GL Vic. NSW volume likely to be borrowed by general security water users in 2015-16)				
Murray Additional Environmental Water Allowance (Murray AEA)	29 702 ML	0 ML				
NSW environmental water hold	lings (Adaptive Enviro	onmental Water)				
Murray – conveyance	30 000 ML	7500 ML (25% conveyance) <sup>1</sup>				
Murray – high security	2027 ML	1622 ML (80% allocation)				
Commonwealth environmenta	water holdings <sup>2</sup>					
Murray <sup>3,4</sup> – general security	327 529 ML	Up to 65 505 ML				
Murray <sup>5</sup> – high security	12 600 ML	Up to 10 080 ML (80% allocation)				
Murray – supplementary	211 ML	211 ML				
Murray – groundwater	1244 ML	1244 ML				
Murray – unregulated	276 ML	24 ML				

Note: This table does not include water available under The Living Murray program.

Under the Water Sharing Plan for the NSW Murray and Lower Darling Regulated Rivers Water Sources (hereafter the WSP), the NSW share of the Barmah–Millewa Environmental Water Allowance water may be borrowed to provide for general security allocations where general security plus average carryover is less than 30 per cent.

The rules for water sharing outlined in the WSP will continue in 2015–16, including that carryover of water in accounts is limited to a maximum of 50 per cent of entitlement for general security licences only. Full conveyance allocation will not be available on 1 July 2015 under drought inflow conditions. It is estimated that 80 000 ML of conveyance will be available on 1 July 2015 and this will increase with resource improvements to 165 000 ML before general security entitlements are made available. As per the Murray Valley Water Sharing Plan, 7500 ML of NSW Adaptive

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<sup>&</sup>lt;sup>1</sup> Volume based on conveyance licence conversion scale where 56% = 21.52 GL.

<sup>&</sup>lt;sup>2</sup> Correct at 31 March 2015 but may change as other CEW holdings become available. A proportion of these will be available for use in the Murray and Lower Darling WRP Area during 2015–16 with Commonwealth environmental holdings from other water sources in the southern-connected basin possibly available for use within this area.

<sup>&</sup>lt;sup>3</sup> Includes 795 ML of Lower Darling general security entitlements.

<sup>&</sup>lt;sup>4</sup> Figure based on average 20% carryover for general security entitlements.

<sup>&</sup>lt;sup>5</sup> Includes 394 ML of Lower Darling high security entitlements.

Environmental Water conveyance entitlements will be available at 1 July. NSW Murray high security entitlements are expected to receive 80 per cent of entitlement, and as high security increases, so too will conveyance, until high security reaches 97 per cent, at which stage conveyance will be 50 per cent of entitlement.

The WSP allows for the Murray additional environmental allocation to be credited when high security entitlements reach 97 per cent, as such, at 1 July, Murray additional environmental allocation will be 0 ML.

The figures given in Table 2 have not been adjusted for possible future trade. OEH periodically trades water allocations to cover a proportion of 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 based on basin-wide environmental water demand and trading opportunities, with consideration of equity between WRP areas over time.

The NSW Office of Water has provided potential general security allocations for 2015–16 based on the likelihood of inflow scenarios, to assist water users, including environmental water holders, to plan for water availability accordingly.

# 6. Resource availability scenario and management outcomes

The resource availability scenario (RAS) is based on surface water availability and antecedent conditions (Appendix A: Table A1). The antecedent conditions are considered to be dry and surface water availability median, so the RAS has been determined to be moderate to dry which means watering will aim to maintain ecological health.

Planning has also incorporated the median and wet RAS in the event that future rainfall events result in average to above-average levels.

Following its consideration of the condition of assets, water availability and climate forecasts, the Murray and Lower Darling EWAG has recommended that the management outcomes for this environmental watering year should ensure environmental assets maintain their basic functions and resilience, and build on the positive environmental outcomes of the recent environmental watering (Appendix A: Table A2). They will do this 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.

# 7. Annual environmental watering priorities

Under a moderate to dry RAS, NSW has identified 28 annual environmental watering priorities for the Murray and Lower Darling WRA (Table 3). If the RAS were to change to wet, additional priorities would be considered.

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 and/or stock 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,

consultation with potentially affected landholders will occur and agreements sought on acceptable event management.

Individual watering events are approved and implemented via the current <u>NSW</u> environmental water planning and operational framework.

Table 3: Murray and Lower Darling watering site priorities under a drymoderate RAS – 2015-16

Location	Sites (size)	Volume estimated	Justification	Timing and comments
Cliffhouse	Lower Murray – near SA border 100 kms from Wentworth (7 ha)	85 ML	Maintain southern bell frog habitat and promote breeding.	Spring
Lake Victoria	Lower Murray – ~ 8kms west of Lake Victoria and next to SA border (30 ha)	300 ML	Maintain vegetation health-river red gum and lignum. Potential habitat for southern bell frog.	Spring
Lucerne Day	Lower Murray – near SA border (6 ha)	150 ML	Poor vegetation health- river red gum and lignum.	Spring
Grand Junction	Lower Murray – near SA border (30 ha)	1000 ML	Poor vegetation health- river red gum and lignum.	Spring
Andruco Lagoon	Lower Murray – near SA border (10 ha)	150 ML	Poor vegetation health- river red gum and lignum.	Spring
Nampoo	Lower Murray – near SA border (11 ha)	200 ML	Maintain vegetation health-river red gum and lignum and southern bell frog habitat and promote breeding.	Spring
Murrien-Yarrien Creek system	Murrien-Yarrien (~150 km)	10 000 ML <sup>1</sup>	Improve fringing RRG, black box and lignum condition, and promote the re-establishment of ground layer vegetation and tall macrophytes (e.g. cumbungi and common reed). Identify and manage risks arising from salinity and sulfidic sediment issues.	Spring

Location	Sites (size)	Volume estimated	Justification	Timing and comments
Elimdale	Mid Murray – on Colligen Ck ~15km west of Deni (12 ha)	150 ML	Follow-up watering event to manage river red gum regeneration and maintain the current vegetation condition.	Spring
Toupna Creek	Murray Valley National Park (Millewa) (~20 km)	2000 ML <sup>2</sup>	Improve habitat conditions for native small-bodied wetland fish, including southern pygmy perch.	Spring and/or autumn if required.
Pollacks Swamp	Mid Murray (160 ha)	500 ML	Poor vegetation health (river red gum), manage river red gum regeneration.	Spring
Koondrook- Perricoota State Forest	Mid Murray	25 000- 50 000 ML	Maintain vegetation condition and native fish recruitment and refuge.	Winter- Spring
Hypoxic Blackwater Mitigation	Murray River Edward-Wakool Rivers	TBC as required	Endeavour to improve water quality to provide refuge for native fish.	As required
Jimaringle, Cockrans and Gwynnes Creeks	Mid Murray approximately 30 km west of Deniliquin (80 km)	6000 ML <sup>1</sup>	Follow up watering to maintain vegetation health.	Spring
Private Property Wetlands in Murray Irrigation District (include Unnamed Creek)	Mid Murray	1000 ML	Poor vegetation health (river red gum, black box, lignum).	Spring
Brechin	Mid Murray near Swan Hill (26 ha)	200 ML	Follow up watering to maintain vegetation health.	Spring
Carrs, Capitts and Bunbaroo Creeks and wetlands	Lower Murray – between Frenchmans Creek and Murray River within lock 8 weirpool (~60 km)	900 ML	Follow up watering to maintain vegetation health.	Spring

Location	Sites (size)	Volume estimated	Justification	Timing and comments
Bingerra Creek	Lower Murray – 4 km north of Tooleybuc (~45 km)	200 ML	To follow up on past events to maintain and maximise vegetation health and response, particularly lignum and river red gum. To manage in channel river red gum sapling recruitment.	Spring
Wee Wee Creek	Lower Murray	1000 – 2000 ML	Follow up watering to maintain small fish populations and vegetation health.	Spring
Tuppal Creek	Mid Murray – departs Murray River near Tocumwal and joins Edward River near Deniliquin (60 km)	6000 ML <sup>1</sup>	Improve water quality, maintain vegetation health.	Spring and autumn
Thegoa Lagoon	Lower Murray – down-stream of Murray Darling junction, west of Wentworth (80 ha)	1200 ML <sup>1</sup>	Follow water regime management plan that 7 years out of 10 to be inundated. River red gum and weed management.	Winter
Yallakool- Wakool flows	Mid Murray	~60 000 ML <sup>1</sup>		
Colligen- Niemur	Mid Murray	~40 000 ML¹	To provide flow conditions that enables the maintenance of instream native aquatic vegetation and habitat for native fish.	Spring

Location	Sites (size)	Volume estimated	Justification	Timing and comments
Locks 7,8, 9 and 15 weirpool manipulations	Lower Murray – west of Wentworth near Lake Victoria	4000 ML <sup>1</sup>	Implement small-scale manipulations to measure possible benefits to aquatic and riparian communities within weirpools.	Winter-spring (raising); Spring- autumn (lowering).
Reedbeds Creek (Werai Forest)	Mid Murray – ~ 20 km south east of Moulamein, IPA (137 km)	2000 ML <sup>1</sup>	Maintain/improve fringing river red gum. To manage in channel river red gum sapling recruitment.	Spring- autumn
Pinchgut Lagoon	Mid Murray Regional Park	1000 ML <sup>1</sup>	Improve habitat conditions for small bodied wetland specialists including southern pygmy perch.	Autumn
Horseshoe Lagoon	Mid Murray Regional Park	1000 ML <sup>1</sup>	Improve habitat conditions for small bodied wetland specialists including southern pygmy perch.	Spring and/or autumn if required.
Speewa Creek	Lower Murray near Koraleigh	1000 ML <sup>1</sup>	Inundated entire length of creek to maintain river red gum condition. Promote aquatic vegetation and frog recruitment.	Autumn- winter
Bengallow Creek	Lower Murray between Euston and Buronga	5000 ML <sup>1</sup>	Retain permanent pools that support native fish communities such as golden perch.	2015-16 water year

<sup>&</sup>lt;sup>1</sup> Potential contribution from CEW

# 8. 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 and cooperative changes to land management to ensure desired ecological responses to watering are achieved.

In the Murray and Lower Darling WRP Area, OEH also works with MDBA River Operations and private irrigation companies and districts, such as Murray Irrigation Ltd and Moira Private Irrigation District.

<sup>&</sup>lt;sup>2</sup> Potential TLM contribution

# 9. Further documentation

Details on the potential use of Commonwealth environmental water entitlements in the Murray and Lower Darling WRA can be found in *Commonwealth Environmental Water Use Options 2015-16: Mid Murray Region* and *Commonwealth Environmental Water Use Options 2015-16: Lower Murray Darling Region* available for the 2015–16 water year at <a href="https://www.environment.gov.au/water/cewo/publications.">www.environment.gov.au/water/cewo/publications.</a>

Reporting on water used throughout the 2015–16 watering season will be included in OEH's *Environmental Water Use in NSW: Outcomes 2015–16* and also in the Commonwealth's *Annual Report 2015–16: Commonwealth environmental water*, available in late 2016.

#### References

DPI 2015, NSW Murray water allocation outlook 2015-16, Department of Primary Industries, Office of Water media release, 15 May 2015, www.water.nsw.gov.au/Water-management/Water-availability

MDBA 2012a, *Basin Plan*, Murray–Darling Basin Authority, Canberra, www.mdba.gov.au/what-we-do/basin-plan

MDBA 2012b, Guidelines for the method to determine priorities for applying environmental water: Murray—Darling Basin Authority, Canberra, www.mdba.gov.au/sites/default/files/Basin-Plan/Statutory-Guideline-Nov-2012.pdf

MDBA 2015a, *Basin Environmental Watering Outlook for 2015-16*, Murray–Darling Basin Authority, Canberra <a href="https://www.mdba.gov.au/media-pubs/publications/basin-environmental-watering-outlook-2015-16">www.mdba.gov.au/media-pubs/publications/basin-environmental-watering-outlook-2015-16</a>

MDBA 2015b, *River Murray Operations Weekly report 10 June 2015*, Murray–Darling Basin Authority, Canberra

# **Appendix A**

Table A1: Determining the resource availability scenario

Surface		Antecedent conditions				
water availability	Very dry	Dry	Median	Wet	Very wet	
Very low	Very dry	Very dry	Dry	Dry	n/a	
Low	Very dry	Dry	Dry	Moderate	Wet	
Median	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 outcomes	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 low-lying floodplain-river connectivity.  Support medium-flow river and floodplain functions.	Enable growth, reproduction and large-scale recruitment for a diverse range of flora and fauna.  Support high-flow river and floodplain functions.	Enable growth, reproduction and large-scale recruitment for a diverse range of flora and fauna.  Support high-flow river and floodplain functions.		

Source: Modification of table in 'Guidelines for the method to determine priorities for applying environmental water' in the Murray–Darling *Basin Plan* (MDBA 2012b), with the objective — 'Promote higher floodplain–river connectivity' — removed from the wet and very wet scenarios.