

2014-15 Annual Environmental Watering Priorities for the South Australian River Murray Water Resource Plan Area

The information contained in this document is prepared for the purpose of complying with South Australia's obligations in respect of annual environmental watering priorities for the South Australian River Murray Water Resource Plan Area, as set out in Chapter 8 of the Murray-Darling Basin Authority Basin Plan (Environmental Watering Plan).

1. Introduction

This document has been prepared to fulfil obligations related to the preparation of Annual Environmental Watering Priorities (the Priorities) as specified in the Basin Plan Chapter 8 Division 4. The principles and method described in Chapter 8 Part 6 of the Basin Plan have been applied in developing these priorities. Additional information as to how these principles and methods were applied will be included in the annual environmental watering plan for the water accounting period 1 July 2014 to 30 June 2015 that will be published later in 2014. This information is gathered from the environmental water managers using an environmental watering proposal template.

2. Identification of priorities

Annual environmental watering priorities for environmental assets and functions

The annual environmental watering priorities for the South Australian River Murray for 2014-15 have been developed in accordance with the Basin Plan. However, a long term watering plan has not yet been written so a list of priority environmental assets and ecosystem functions is not yet available. The priorities are summarised in Table 1. The annual priorities were developed using three scenarios based on the MDBA multi history plot (**Figure 1**): Dry: 90%, Dry/Median 75% and Median 50%. These percentages refer to the likelihood of occurrence based on previous records. Proposed watering actions for the assets were ranked under each flow scenario and the agreed rankings are presented in Table 1. The optimal timing for flow enhancement actions is spring-summer.

The potential testing of the Chowilla regulator is a very high priority for the Murray-Darling Basin Authority and for the South Australian Government. This action was not ranked against other proposed watering actions but it has been included in the following table as equal highest priority. Further details for each site are provided in the annual environmental watering plan.

A decision whether to test has not yet been made. A final decision to proceed with testing of the Chowilla regulator will be made following consideration of a number of factors, including risks associated with legal proceedings and the availability of the required environmental conditions. The South Australian government is undertaking preparations to satisfy all pre-conditions for testing should a decision to proceed with testing be made.

The Coorong is addressed in this document rather than in the annual priorities for the Murray Region Water Resource Planning Area as its primary source of water is via the River Murray.

In addition to the South Australian priorities listed above, the Nature Foundation of South Australia will be undertaking environmental watering actions for 2014-15 at selected sites agreed with the Commonwealth Environmental Water Holder (CEWH).

The annual priorities have been developed based on environmental assets, rather than ecosystem functions. However, the assets outlined in this Plan, their environmental water requirements and the planned actions for 2014-15, have been developed by considering the ecosystem functions relevant to each site.

Table 1: 2014-15 Environmental Watering Priorities for the South Australian River Murray

Priority actions	Dry scenario 90%	Dry/Median scenario 75%	Median 50%
1.	12 months of barrage releases; Potential testing of Chowilla regulator	12 months of barrage releases; short flow pulse for CLLMM; long flow pulse for CLLMM; Potential testing of Chowilla regulator;	long flow pulse for CLLMM; create 25,000 ML/day flow pulse for up to 90 days; Potential testing of Chowilla regulator;
2.	Provision of water to threatened fish refuges	Provision of water to threatened fish refuges; create 15,000 ML/d flow pulse for up to 90 days	Gravity fed wetlands; pump temporary wetlands; create 25,000 ML/day flow pulse for up to 60 days
3.	Create 10,000 ML/d flow pulse for up to 90 days; vary Lower Lake levels	Create 15,000 ML/d flow pulse for up to 60 days; vary Lower Lake levels	Raise weir pools 1 and 2 up to 50 cm
4.	Gravity fed wetlands; pump temporary wetlands	Gravity fed wetlands; pump temporary wetlands	Lake cycling
5.	Create 10,000 ML/d flow pulse for 60 days; pump Lower Lake fringing wetlands	Raise weir pools 1 and 2 up to 20 cm	

South Australia has defined the scenarios for 2014-15 slightly differently to MDBA TLM with the 90% AEP representing a 'dry' scenario and 75% representing a 'dry/median' scenario rather than 'extremely dry' and 'dry', respectively. This is to better reflect local conditions. From a South Australian perspective a 'very dry' scenario would apply under below-entitlement conditions or if we had only received entitlement flow for a number of consecutive years. These minor differences in definitions were accepted by MDBA TLM staff.

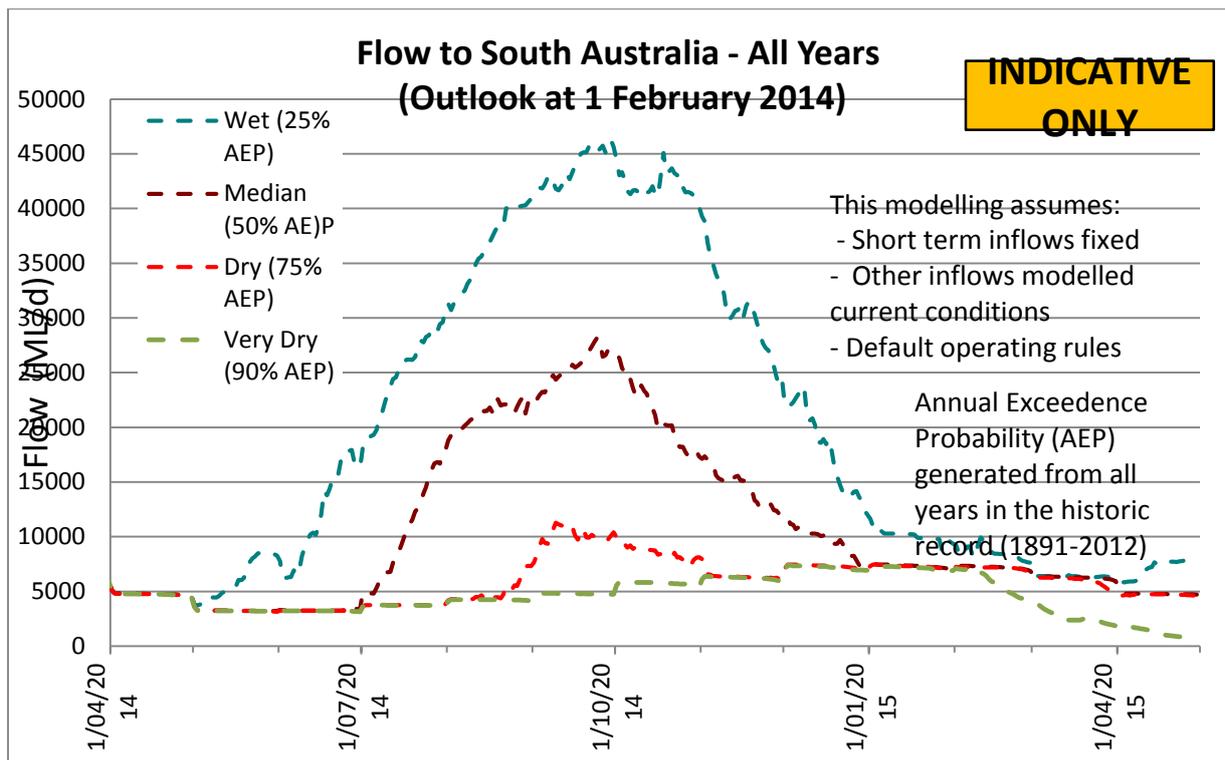


Figure 1: MDBA multi-history

Assumptions

Held Environmental Water Availability

The expected holdings of environmental water are available from four sources – the Commonwealth Environmental Water Holder (CEWH), The Living Murray (TLM), the South Australian Government and non-government organisations.

Commonwealth Environmental Water

Total Commonwealth environmental water holdings within the Southern Connected Basin are approximately 1,202 GL, with varying levels of security and a long term average annual yield of 990 GL. The breakdown of the CEWH water holdings in the Southern Connected Basin is set out in Table 2. It is uncertain what allocations will be available for 2014-15. However DEWNR staff were advised that 500-700 GL would be available.

Table 2: CEWH water holdings in the Southern Connected Basin (Feb 2014)

Security	Entitlement (ML)	Long Term Average Annual Yield (ML)
High	606,634	570,831
General / Low	563,666	407,210
Conveyance	10,716	9,871
Supplementary	21,031	3070
Total	1,202,046	990,982

The Living Murray Environmental Water

TLM water holdings are equivalent to approximately 479 GL of water, as set out in Table 3. Increased flows from the Snowy Agreement may also be available if there is agreement to call on some of this water. DEWNR staff have been advised that 217-245 GL of TLM water will be available.

Table 3: TLM water holdings in the Southern Connected Basin (2014)

Security	Entitlement (ML)	Long-Term Cap Equivalent (ML)
High	114,225	106,829
General / Low	476,554	295,146
Conveyance	350,000	40,900
Supplementary	47,265	37,100
Total	988,044	479,975

South Australian Environmental Water

The volume of water held by South Australia varies from year to year, based on the water that is available and the water that is purchased. The licence holding this water is administered by the Department of Environment, Water and Natural Resources (DEWNR) and the held water contributes to addressing the identified Priorities. There is 6 GL of Class 3A Water Access Entitlement held on the Minister for Water and the River Murray's licence (water allocation against this 6 GL will be 100 percent for 2014-15) and additional amounts (up to 120 GL over a 10 year rolling period of eligible years) are also required to be provided to the environment.

The WAP for the River Murray Prescribed Watercourse also establishes Class 9 Water Access Entitlements of 200 GL or 200,000,000 unit shares. This volume is the estimated annual evaporative loss from all wetlands that are connected to the South Australian River Murray at normal operating

pool level. Of this 200 GL, approximately 34 GL (or 34,781,915 unit shares) have been assigned to a Minister for Water and the River Murray's licence for use in managed pool-connected wetlands.

Non-Government Organisations

Nature Foundation SA holds 37 ML of Class 3A Water Access Entitlement on licence that is irrigation water purchased for environmental use. The Foundation also has access to up to 10 GL of water allocation each year from the CEWH for its work along the River Murray in South Australia. This is a portion of the total volume held by CEWH in the Southern Connected Basin.

The Murray Darling Association, through its Murray Darling Foundation, has established 'Water Bank' that receives donations for purchasing and holding water for future environmental activities. It holds 60 ML of Class 3A Water Access Entitlement but has no plans for environmental watering in 2014-15.

Planned Environmental Water Availability

Unregulated Flows

The Water Allocation Plan for the River Murray Prescribed Watercourse allows water to be allocated to high security licences only. Under the Murray-Darling Basin Agreement and the WAP, no provisions exist for the allocation and use of unregulated flows for non-environmental consumptive purposes in South Australia. Therefore, when an unregulated flow event occurs, it is protected from other water users. Unregulated flows generally occur in response to high rainfall events upstream from South Australia. The MDBA Environmental Watering Group has delegated authority from the Basin Officials Committee to allocate unregulated flow for environmental purposes in the River Murray.

Under the different flow scenarios shown in Figure 1, unregulated flow provides the increase in height and volume of water above South Australia's Entitlement Flow. This unregulated flow can only be planned for in a general way, but if it occurs then it is able to achieve environmental outcomes in South Australia. South Australia uses scenario based planning based on the Murray-Darling Basin's multi history plot (see Figure 1). The priorities have been prepared for three scenarios: 90%, 75% and 50%.

200 GL of class 9 water

The WAP for the SA River Murray Prescribed Watercourse establishes 200 GL or 200,000,000 unit shares of Class 9 Water. This volume is the estimated annual evaporative loss from all wetlands that are connected to the South Australian River Murray at normal operating pool level. Of this 200 GL, approximately 34 GL (or 34,781,915 unit shares) have been assigned to a Minister for Water and the River Murray's licence for use in managed pool-connected wetlands. (see above). The remaining 166 GL of Class 9 water will be used by non-managed, pool-connected wetlands via evaporation during normal river operations and is not available for other use. The priority for 2014-15 is to implement ecologically sound hydrological regimes at all managed, pool-connected wetlands. DEWNR staff manage the water allocation for managed wetlands. The water allocation for Class 9 water access entitlements in 2014-15 will be 100 percent.

3. Co-operative Watering Arrangements

Holders and managers of environmental water

For the last four years, holders and managers of environmental water have worked together to plan and coordinate annual multi-site environmental watering trials. The trials attempt to maximise the use of environmental water by re-using return flows as the water moves through the southern connected Basin. In 2013 the MDBA Basin Officials Committee agreed that the long-term objective of the multi-site environmental watering trials is to work towards incorporating environmental delivery into normal River Murray operations. This is occurring by identifying and analysing issues and potential changes to current operational practices. An additional objective is to implement policy measures from the Basin Plan.

These include:

- credit environmental return flows for downstream environmental use; and
- allow the call of held environmental water from storage during un-regulated flow events.

Each year the multi-site environmental watering trials have tested a range of actions including new accounting methods, addition of environmental water to unregulated flows, use of loss factors and coordination of environmental releases with natural flow peaks. Each trial builds on lessons learned from the previous year and enhances understanding of the key elements for a success.

The MDBA Environmental Watering Group and Water Liaison Working Group contribute to the development of the multi-site strategy each year. Real-time operations groups hold regular teleconferences to ensure coordination and communication during the trial and rapid response to any issues that may arise, such as black water events. An environmental watering trial is proposed for 2014-15. Environmental water holders are working towards co-ordinated delivery from releases in the Murray, Murrumbidgee, Darling and the Goulburn to maximise environmental benefits at multiple sites.

The ecological objectives and the environmental water used will vary depending on the seasonal conditions. For example, concurrent delivery of water from the Goulburn, Murrumbidgee and Darling Rivers will increase flow along the River Murray in South Australia and boost flows into the Coorong, Lower Lakes and Murray Mouth. There will be in-stream benefits along the entire River Murray System from Hume Dam to the Murray Mouth.

South Australia is participating in the planning for the multi-site watering trial for 2014-15 through the MDBA Environmental Watering Group and Water Liaison Working Group and will contribute to the operations groups for the management and delivery of the environmental water available from all water holders.

For 2014-15, DEWNR has written a multi-site plan for the use of environmental water within the South Australian River Murray. For example, if environmental water is allocated and used to test the Chowilla regulator, then there will be return flows to the River Murray downstream from Chowilla Creek. Under the WAP for the River Murray, this water may not be re-allocated for consumptive use. Therefore it is available for use at other sites as it flows down the river and will eventually be

delivered to the Lower Lakes, Coorong and Murray Mouth for ecological benefit. The multi-site description will be provided in the annual environmental watering plan.

2014-15 Environmental watering priorities for the South Australian River Murray

90% AEP Scenario

Site	Action	Additional details	Objectives	Approximate Volume (GL)
LLCMM	Lake level manipulation	6 months, July – December	Wet/dry fringing wetlands – zooplankton emergence	380
	Barrage releases	12 months, fishways only	Connectivity; Fish passage	120
	Pump to fringing wetlands	4 sites (Milang, Tolderol, Point Sturt, Gollan’s)	Habitat for EPBC migratory birds and southern bell frog	0.4
Channel	10,000 ML/day flow pulse x 60 days	September - March	Vary water levels in tailwaters; Improve velocity	250 – 300
	10,000 ML/day flow pulse x 90 days	Mid-September - mid-December	Perch larval dispersal/survival	300 - 450
	Pump to temporary wetlands	30 sites – to be determined	Various – depends on sites selected	10.3
	Gravity fed wetlands	Bookmark Creek + managed wetlands	Refer to wetland management plans	35
	Threatened fish refuges	2 sites (Dishers Creek and Berri Evaporation Basin)	Support Murray hardyhead	1.5
Chowilla	Potential testing of regulator ¹	Within channel rise	Works and measures testing; Groundwater/vegetation/fauna outcomes	39
	Pump to temporary wetlands	4 sites		Up to 6.4

¹ A decision whether to test has not yet been made. A final decision to proceed with testing of the Chowilla regulator will be made following consideration of a number of factors, including risks associated with legal proceedings and the availability of the required environmental conditions. The South Australian government is undertaking preparations to satisfy all pre-conditions for testing should a decision to proceed with testing be made.

75% AEP Scenario

Site	Action	Additional details	Objectives	Approximate Volume (GL)
LLCMM	Lake level manipulation	6 months, July – December	Wet/dry fringing wetlands – zooplankton emergence	200
	Barrage releases	12 months	Connectivity; Fish passage	70
	Short pulse	Mid-October - mid-January	Coorong <i>Ruppia</i>	330
	Long pulse	Mid-October - mid-March	Coorong waterbirds and fish	500
Channel	15,000 ML/day flow pulse x 60 days	September – March	Vary water levels in tailwaters; Improve velocity (Sub-optimal for fish objectives)	200 – 250
	15,000 ML/day flow pulse x 90 days	Mid-October - mid-January	Perch and Murray cod recruitment	500
	Pump to temporary wetlands	28 sites – to be determined	Various – depends on sites selected	9.5
	Gravity fed wetlands	Bookmark Creek + managed wetlands	Refer to wetland management plans	35
	Threatened fish refuges	2 sites (Disher Creek and Berri Evaporation Basin)	Support Murray hardyhead	1.5
	Weir raising	Lock 1 up 15cm; Lock 2 up 20 cm	Trial approval process and communication protocols; increase area of inundation	~8
Chowilla	Potential testing of regulator ²	Low floodplain	Works and measures testing; Groundwater/vegetation/fauna outcomes	130
	Potential testing of regulator ³	Low-mid floodplain	Works and measures testing; Groundwater/vegetation/fauna outcomes	290
	Pump to temporary wetlands	4 sites		Up to 6.4

² A decision whether to test has not yet been made. A final decision to proceed with testing of the Chowilla regulator will be made following consideration of a number of factors, including risks associated with legal proceedings and the availability of the required environmental conditions. The South Australian government is undertaking preparations to satisfy all pre-conditions for testing should a decision to proceed with testing be made.

³ See footnote 2

50% AEP Scenario

Site	Action	Additional details	Objectives	Approximate Volume (GL)
LLCMM	Lake level cycle	4 weeks, March – April	Lake Albert ecology	300
	Long pulse	Mid-October - mid-March	Coorong waterbirds and fish	500
Channel	25,000 ML/day flow pulse x 60 days (30 days sub-optimal)	September - March	Redgum condition/germination/recruitment; Velocity; Productivity	150 – 300
	25,000 ML/day flow pulse x 90 days (60 days sub-optimal)	October – December	Murray cod, perch, frog breeding, waterbirds	300 – 450
	Pump to temporary wetlands	23 sites – to be determined	Various – depends on sites selected	7.4
	Gravity fed wetlands	Bookmark Creek + Class 9 wetlands	Refer to wetland management plans	35
	Threatened fish refuges	2 sites (Disher Creek and Berri Evaporation Basin)	Support Murray hardyhead	1.5
	Weir raising	Lock 1 up 35cm; Lock 2 up 50cm	Trial approval process and communication protocols; increase area of inundation	~20
Chowilla	Potential testing of regulator ⁴	Low-mid floodplain	Works and measures testing; Groundwater/vegetation/fauna outcomes	40
	Pump to temporary wetlands	4 sites		Up to 6.4

⁴ A decision whether to test has not yet been made. A final decision to proceed with testing of the Chowilla regulator will be made following consideration of a number of factors, including risks associated with legal proceedings and the availability of the required environmental conditions. The South Australian government is undertaking preparations to satisfy all pre-conditions for testing should a decision to proceed with testing be made.