

Water Application Across the River Murray System and Icon Sites: Status Report February 2006



Water Application Across the River Murray System and Icon Sites: Status Report

February 2006



Integrated catchment management in the Murray–Darling Basin

A process through which people can develop a vision, agree on shared values and behaviours, make informed decisions and act together to manage the natural resources of their catchment: their decisions on the use of land, water and other environmental resources are made by considering the effect of that use on all those resources and on all people within the catchment.

Our values

We agree to work together, and ensure that our behaviour reflects the following values.

Courage

- We will take a visionary approach, provide leadership and be prepared to make difficult decisions.

Inclusiveness

- We will build relationships based on trust and sharing, considering the needs of future generations, and working together in a true partnership.
- We will engage all partners, including Indigenous communities, and ensure that partners have the capacity to be fully engaged.

Commitment

- We will act with passion and decisiveness, taking the long-term view and aiming for stability in decision-making.
- We will take a Basin perspective and a non-partisan approach to Basin management.

Respect and honesty

- We will respect different views, respect each other and acknowledge the reality of each other's situation.
- We will act with integrity, openness and honesty, be fair and credible, and share knowledge and information.
- We will use resources equitably and respect the environment.

Flexibility

- We will accept reform where it is needed, be willing to change, and continuously improve our actions through a learning approach.

Practicability

- We will choose practicable, long-term outcomes and select viable solutions to achieve these outcomes.

Mutual obligation

- We will share responsibility and accountability, and act responsibly, with-fairness and justice.
- We will support each other through necessary change.

Our principles

We agree, in a spirit of partnership, to use the following principles to guide our actions.

Integration

- We will manage catchments holistically; that is, decisions on the use of land, water and other environmental resources are made by considering the effect of that use on all those resources and on all people within the catchment.

Accountability

- We will assign responsibilities and accountabilities.
- We will manage resources wisely, being accountable and reporting to our partners.

Transparency

- We will clarify the outcomes sought.
- We will be open about how to achieve outcomes and what is expected from each partner.

Effectiveness

- We will act to achieve agreed outcomes.
- We will learn from our successes and failures and continuously improve our-actions.

Efficiency

- We will maximise the benefits and minimise the costs of actions.

Full accounting

- We will take account of the full range of costs and benefits, including economic, environmental, social and off-site costs and benefits.

Informed decision-making

- We will make decisions at the most appropriate scale.
- We will make decisions on the best available information, and continuously improve knowledge.
- We will support the involvement of Indigenous people in decision-making, understanding the value of this involvement, and respecting the living knowledge of Indigenous people.

Learning approach

- We will learn from our failures and successes.
- We will learn from each other.

February 2006

**Water application across the River
Murray system and Icon Sites:
Status Report**

*This report was released by the Murray-Darling Basin
Ministerial Council at Meeting 40, May 2006*

Published by: Murray-Darling Basin Commission
Postal Address: GPO Box 409, Canberra ACT 2601
Office location: Level 5, 15 Moore Street, Canberra City, Australian Capital Territory
Telephone (02) 6279 0100; international + 61 2 6279 0100
Facsimile (02) 6248 8053; international + 61 2 6248 8053
E-Mail info@mdbc.gov.au
Internet <http://www.mdbc.gov.au>

For further information contact the Murray-Darling Basin Commission office on (02) 6279 0100

This report may be cited as:

Water application across the River Murray system and Icon Sites: Status Report

Murray-Darling Basin Commission, Canberra.

MDBC Publication No. 25/06

ISBN 1 921038 91 8

© Copyright Murray-Darling Basin Commission 2006

This work is copyright. Graphical and textual information in the work (with the exception of photographs and the MDBC logo) may be stored, retrieved and reproduced in whole or in part, provided the information is not sold or used for commercial benefit and its source (*Water application across the River Murray system and Icon Sites: Status Report*) is acknowledged. Such reproduction includes fair dealing for the purpose of private study, research, criticism or review as permitted under the Copyright Act 1968. Reproduction for other purposes is prohibited without prior permission of the Murray-Darling Basin Commission or the individual photographers and artists with whom copyright applies.

To the extent permitted by law, the copyright holders (including their employees and consultants) exclude all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this report (in part or in whole) and any information or material contained in it.

The contents of this publication do not purport to represent the position of the Murray-Darling Basin Commission. They are presented to inform discussion for improvement of the Basin's natural resources.

Ref. No. MDBC11171

This publication is printed on Monza Satin, a 50% recycled and coated paper

Executive Summary	1
Section A:	
Purpose of the Status Report	3
Section B:	
Methods for environmental water application currently used at the Icon Sites	5
Section C:	
Environmental water use and accounting across the Icon Sites	7
Section D:	
Environmental watering actions and key outcomes at the Icon Sites (particularly since Spring 2005)	12
Section E:	
Progress towards meeting the Living Murray Asset Environmental Management Plan ecological objectives	21
Section F:	
Community consultation	28
Section G:	
Key learning's from experience to date that will assist future management	31
Section H:	
Possible further environmental watering actions for the remainder of 2005-06 at the Icon Sites	33

Executive Summary

1. Since November 2003, existing water available to the environment (not including any Living Murray water) and infrastructure has been actively managed collaboratively by jurisdictions and the Murray-Darling Basin Commission. This work has contributed towards meeting the ecological objectives for the Living Murray (TLM) First Step decision's six Icon Sites. In this context, the 2005-06 season represents the most active season of environmental management in the history of river regulation.
2. Over 36 000 Ha of the natural environment of the River Murray system and Icon Sites has been deliberately watered for environmental purposes in 2005/06 (to February). The sources of water used included a combination of:
 - the accumulated Barmah-Millewa Forest Environmental Water Allocation (BMF EWA);
 - other existing state-based environmental allocations (e.g. Victorian Murray Flora and Fauna Entitlement, NSW Adaptive Environmental Water);
 - River Murray surplus flows and Above Entitlement Flows to South Australia (part thereof); and
 - River Murray Increased Flows from the Snowy available under the River Red Gum Rescue Package agreed to by Ministerial Council in September 2005.
3. Given that no 'new' TLM water has yet been recovered, the positive environmental benefits observed - especially in 2005-06 - have been the result of intelligent use of existing water available to the environment, use of new and existing infrastructure and improved planning and cooperation developed through the Living Murray process.
4. Environmental actions and outcomes in 2005-06 included the:
 - (a) Release of an accumulated 5 years worth of the Barmah-Millewa Forest Environmental Water Allocation (~510 GL) to achieve one of the most significant colonial nesting waterbird breeding events in recent decades and the spawning of threatened fish such as Silver Perch;
 - (b) Delivery of environmental water through various means such as flow enhancement, pumping/siphoning, weir manipulation (Lock 1, 4, 5, 6, 8 and 26), and use of regulated creeks/channels to reinvigorate stressed floodplain vegetation including River Red Gums, and to fill wetlands across Gunbower Forest, Hattah Lakes, Chowilla Floodplain (including Lindsay-Wallpolla) and the River Murray Channel;
 - (c) Release of water through the Barrages at the Murray Mouth which provided temporary freshening of parts of the Coorong; and 7 months continuous operation of fishways (to February, but continuing until about April 2006) allowing the passage of thousands of small-bodied native fish and collectively using less than 100 ML/day to operate.

5. The benefits to the Icon Sites have not been equal. Of the six sites, Barmah-Millewa Forest is the only one to have met all of the major ecological objectives, a result possible only because of the availability of the pre-existing environmental water allocation.
6. Furthermore, the actions at other Icon Sites have contributed only partially to meeting their objectives. An example is the River Red Gum Rescue where results have been positive to date, but limited in scale by the capacity to deliver the water to the sites by means other than elevating river levels. This necessitated a focus on a small range of species (i.e. River Red Gum communities) &/or relatively discrete floodplain/wetland areas. As such, larger areas of floodplain continue to decline in health (e.g. Chowilla Floodplain).
7. Despite the lack of Living Murray water this year, the Living Murray 'umbrella' has greatly facilitated a rapid response to environmental watering opportunities this season, focussing on the Asset Environmental Management Plan ecological objectives at the Icon Sites.
8. In addition to the biophysical benefits of environmental watering, recent experiences have reinforced local and inter-agency partnerships and coordination and increased community awareness of and support for the Living Murray.

Section A: Purpose of the Status Report

1. This is a Status Report on implementation of the 'Water Application' section of the *Living Murray Business Plan*. It has been prepared by the Environmental Watering Group (EWG) in consultation with Living Murray Icon Site Managers.
2. This report covers the 18 month period to February 2006, with a particular focus on actions since Spring 2005 – a time when favourable river flow conditions provided greater opportunities for environmental watering. A comprehensive two year report for 2004/05 – 2005/06 will be prepared for consideration at the September 2006 Ministerial Council Meeting.
3. The Environmental Watering Group (EWG) has delegated responsibilities under the *Living Murray Business Plan* with regard to Water Application across the six Living Murray Icon Sites (summarised at **Table 1**).
4. This report specifically addresses:
 - (a) Environmental watering actions and key outcomes at the Icon Sites;
 - (b) Progress towards meeting the Living Murray Asset Environmental Management Plan objectives; and
 - (c) Trends in the condition of the Icon Sites since the Living Murray First Step decision of November 2003.

Table 1: Responsibilities of the EWG identified in TLM Business Plan and status as at February 2006.

Responsibilities of the EWG identified in TLM Business Plan	Status (as at February 2006)
Develop and implement the <i>Living Murray Environmental Watering Plan</i> (LMEWP) (Clauses 105, 130)	-2004/05 and 2005/06 LMEWP completed -2006-07 LMEWP commenced development
Develop and implement <i>River Murray Channel Asset Environmental Management Plan</i> (RMC AEMP) (Clause 97)	-2005/06 RMC AEMP completed -2006/07 RMC AEMP commenced development
Ensure consistency between the LMEWP and six AEMPs (Clause 105)	Commenced and ongoing
Coordination between TLM & relevant aspects of the Basin Salinity Management Strategy (Clause 106)	Commenced
Consultation on LMEWP & RMC AEMP (Clauses 130, 131, 136)	Commenced and ongoing
Develop approach to risk management (Clause 147)	Commenced
Develop monitoring & adaptive management arrangements for the Icon Sites (Clauses 149-152)	Commenced
Reporting on Water Application (Clause 153)	Report covering the period 2004/05-2005/06 commenced

Section B: Methods for environmental water application currently used at the Icon Sites

1. The water available for environmental use in 2004/05 and 2005/06 has been delivered to sites using various methods (summarised at **Table 2**):
 - (a) ‘flow enhancement’ - involves releasing additional water from storages to enhance flow rates and raise river levels downstream;
 - (b) ‘weir manipulation’ - involves raising or lowering the upstream weir pool level to flood or dry areas in the vicinity of the Lock/Weir;
 - (c) ‘regulated creeks/channels’ – involves use of creeks/anabranches &/or irrigation supply channels to gravity feed water into wetlands;
 - (d) ‘pumping/siphons’ - involves pumping or siphoning water from the river to discrete wetland systems; and
 - (e) ‘Barrage release’ - involves releasing water from the Lower Lakes through the Barrage gates and fishways into the Coorong and Murray Mouth.

Table 2: Methods for environmental water application currently used at the Icon Sites.

	Flow enhancement	Weir Manipulation	Regulated creeks/channels	Pumping/siphons	Barrage release
BMF					
G-K-P					
HL					
CLW					
MMLLC					
RMC					

2. Several operational “committees” convened by the Commission Office (River Murray Environmental Manager & River Murray Water), participated in regular teleconferences to coordinate the real time management of the environmental watering actions. These included:
 - (a) Barmah-Millewa Forest Operations Committee;
 - (b) Lock 8 Operations Committee;
 - (c) Locks 1, 4, 5 and 6 Operations Committee (convened by DWLBC); and the
 - (d) Barrages Operating Committee.
3. The naming of these “committees” will be revised as necessary to align with the convention agreed by Commission at its last meeting.
4. The membership of these “committees” includes lead Icon Site Managers and representatives from State Natural Resource Management Agencies, Catchment Management Authorities, research organisations and State Constructing Authorities.
5. Critical matters relating to system operation, water accounting and water availability have been referred as necessary to the Water Liaison Working Group (formerly the Water Liaison Committee) and the Environmental Watering Group (EWG).

Section C: Environmental water use and accounting across the Icon Sites

2004/05

1. Inflow to the River Murray System during 2004/05 was relatively low (expected to be exceeded in 75% of years) and environmental watering opportunities were limited. As such only a short summary is provided.
2. There were several unregulated inflow events resulting in brief flooding of the Barmah-Millewa Forest, where the NSW Murray Wetlands Working Group provided environmental water to assist a waterbird breeding event.
3. River Murray 'surplus flows', Victorian Murray Flora and Fauna Entitlement and NSW Adaptive Environmental Water were used to water a range of wetlands in Gunbower Forest, along the River Murray Channel and throughout the Edward-Wakool system.
4. Watering at Hattah Lakes and the Chowilla Floodplain (including Lindsay-Wallpolla) Icon Sites was restricted to pumping water to individual wetlands (e.g. **Fig. 1**) and a 15 cm raising at Lock 6. The exceptionally dry conditions led to new collaborative efforts, such as the donation of water by Mallee Irrigators and the use of NSW Adaptive Environmental Water on parts of the Chowilla Floodplain in South Australia.
5. Further downstream, there was sufficient flow into the Lower Lakes to release approximately 40 GL through the Barrages and into the Coorong and through the Murray Mouth.

2005/06

6. Inflow to the River Murray system during 2005/06 (to February), excluding the Darling River, was close to the long-term median inflow, and the wettest year since 2000/01.
7. Significant rain events resulted in filling of the Lower Lakes in South Australia during July, and 'payback' of the Barmah-Millewa Forest Environmental Water Allocation (BMF EWA) by September 2005. Rainfall and Eastern Mount Lofty Tributary contributions facilitated the filling of the Lower Lakes to 0.85m AHD in late July 2005 allowing releases through the Barrages and fishways to commence on 22 July 2005. The rainfall events in North Eastern Victoria combined with some of the Barmah-Millewa Forest Environmental Water Allocation, further supplemented the releases from early September 2005.
8. Following agreement by Ministerial Council in September 2005, 19 GL of Snowy Above Target Environmental Water (hereafter 'Snowy Increased Flows') was made available to drought stressed vegetation (including River Red Gums) and to extend the duration of releases from fishways at the Murray Mouth Barrages.

9. Over 36 000 Ha of the natural environment of the River Murray system and Icon Sites has been deliberately watered for environmental purposes in 2005/06 (to February). The sources of water used included a combination of:
 - (a) the accumulated Barmah-Millewa Forest Environmental Water Allocation (BMF EWA);
 - (b) other existing state-based environmental allocations (e.g. Victorian Murray Flora and Fauna Entitlement, NSW Adaptive Environmental Water);
 - (c) River Murray surplus flows and Above Entitlement Flows to South Australia (part thereof); and
 - (d) River Murray Increased Flows from the Snowy available under the River Red Gum Rescue Package agreed to by Ministerial Council in September 2005 (**Fig. 2, Table 3**).
10. A 5 GL fishway allocation was announced by the South Australian Minister for the River Murray to enable continued operation of the fishways from early February 2006.
11. No 'Living Murray' water was available for these actions which has constrained the extent of benefits that could be achieved.
12. For the Barmah-Millewa Forest, environmental water use was calculated by estimating 'net consumption' (inflow minus outflow) rather than the volume released from the EWA at Hume Dam. This is because water draining from the forest returned to the river downstream providing supplementary access to NSW and Victorian irrigators. The water was also available for other environmental purposes and to improve resource availability (i.e. partially re-regulated in Lake Victoria to supply South Australia's Entitlement Flow).
13. The release of the BMF EWA contributed to a prolonged period of surplus flow availability in the River Murray and as such it is difficult to separate these into two components. **Figure 2** and **Table 3** summarise the environmental and surplus water use (net consumption) between July 2005 and February 2006.
14. 'Net consumption' of water at other sites was calculated using various methods depending on the method of water application, including:
 - (a) pump/siphon capacities;
 - (b) flow gauging downstream of regulators; or
 - (c) estimate of evapo-transpiration and soil infiltration from area of inundated floodplain.
15. The total volume of water released through the Barrages during 2005/06 was about 640 GL (compared with a long-term median annual flow through the Barrages under modelled current conditions of 3, 100 GL) (**Fig. 2, Table 3**). The volume of water released through the fishways between mid July 2005 and early February 2006 was about 15 GL.

16. About 190 GL of the BMF EWA that was not able to be re-regulated in Lake Victoria crossed the SA Border as Above Entitlement Flow. A portion of the Above Entitlement Flow to SA (of 450 GL that crossed the SA Border), as well as local rainfall and Eastern Mount Lofty Ranges tributary inflows, was released from the Barrages and fishways at Goolwa and Tauwichee Barrages (**Table 3**). Most or all of this volume of water would have been released from the Barrages anyway as 'spill' when the level of the lower lakes exceeded their surcharge level of 0.85m AHD. From an environmental perspective, the advantage was that the AEMP for this Icon Site as well as advice from the Barrages Operating Committee provided the opportunity to actively manage the release of this water to target specific environmental outcomes.
17. The lower than expected use of the Snowy Increased Flows (1.5 GL to February 2006) (**Table 3**) is primarily due to the extended availability of 'surplus flow' during spring 2005 that was instead used. All States are planning to use the remaining portion of Snowy Increased Flows during autumn 2006. It is possible that some water may need to be carried over into 2006-07.



Figure 1: Mobile pumping infrastructure used to deliver water to the Hattah Lakes Icon Site (Photo: Murray-Darling Basin Commission).

Table 3: Summary of net environmental and surplus water consumption across the River Murray System and the Icon Sites (1 July 2005 to 1 February 2006).

	BMF EWA release (510 GL) and surplus flows (GL)	Vic. Murray Flora and Fauna Entitlement (GL)	NSW Adaptive Environmental Water (GL)	Snowy Increased Flows (GL)	Other	Total (GL)	Area Watered (Ha)
ICON SITES							
Barmah-Millewa Forest (NSW/Vic.)	213 ¹					213	30000
Gunbower-Koondrook-Pericoota Forest (NSW/Vic.)	11	10				21	100
Hattah Lakes (Vic.)	3.4	0.8				4.2	300
Chowilla-Lindsay-Walpolia (NSW, Vic., SA) ²	11.4		0.2	1.1		12.7	1930 ⁵
Lower Lakes-Coorong-Murray Mouth (SA)	190 ³				450 ⁴	640	
River Murray Channel (NSW, Vic., SA)	7.7	3.5	0.1	0.4		11.7	1480
OTHER SIGNIFICANT SITES-River Murray system⁶							
NSW: Wanganella Swamp/Edward Wakool-MIL			6.5			6.5	800
Victoria: Kerang Lakes, Cardross Basin	2.1	3.7				5.7	630
Total	438	17.9	6.8	1.57	450	915	36245

As at 1 February 2006

¹ 93 GL during BMF EWA release, 120 GL surplus flows prior to BMF EWA release.

² Includes weir manipulation at Lock/Weirs 6 & 8.

³ About 190 GL of the BMF EWA that was not able to be re-regulated in Lake Victoria crossed the SA Border as Above Entitlement Flow.

⁴ Refers to that portion of the Above Entitlement Flow to SA (of 450 GL that crossed the SA Border), as well as local rainfall and Eastern Mount Lofy Ranges tributary inflows, that was released from the Barrages and fishways at Goolwa and Tauwiche Barrages.

⁵ Difficult to estimate area of influence.

⁶ Please note that a significant volume of surplus flows and BMF EWA release watered many wetlands and floodplain areas along the River Murray system that naturally flood during higher flow periods. It is difficult to estimate the total area affected by these flows (i.e. areas outside the Icon Sites where water use was not specifically monitored). As such the figures provided are less likely to be an under-estimate of the extent of watering achieved across the River Murray system.

⁷ Note that a significant volume (17.5 GL) to be used during Autumn 2006 for River Red Gum Rescue and Barrage Fishway release.

Figure 2: Map showing net environmental and surplus water consumption across the River Murray System and the Icon Sites (1 July 2005 to 1 February 2006).

