10 Institutions and incentives for promoting better policies and outcomes: challenges of achieving environmental outcomes that require coordination across multiple jurisdictions

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Abstract

The Murray–Darling Basin Commission (MDBC) is an unincorporated joint venture involving six governments. Its mandate is to provide coordinated planning and management of environmental (chiefly water) resources in the Murray–Darling Basin. With a history of over 90 years, the MDBC has evolved from an engineering-focused, state-based organisation for river management and operation, mainly for consumption and navigation. It is now a natural resource management organisation operating in a politically-charged environment of fundamentally reducing water availability and increasingly centralised control and funding. The mandate and structure of MDBC and decision-making arrangements have proved sufficiently robust over the longer term, where lengthy negotiations preceded significant decisions. This may be much less satisfactory in an environment of unforeseen and rapidly reducing water availability, a rapidly moving media cycle and highly politically-sensitive issues. The institutional arrangements and factors which have underpinned the organisation's progress to date are outlined with particular emphasis on one of the MDBC's major programs — The Living Murray (an environmental water recovery program).

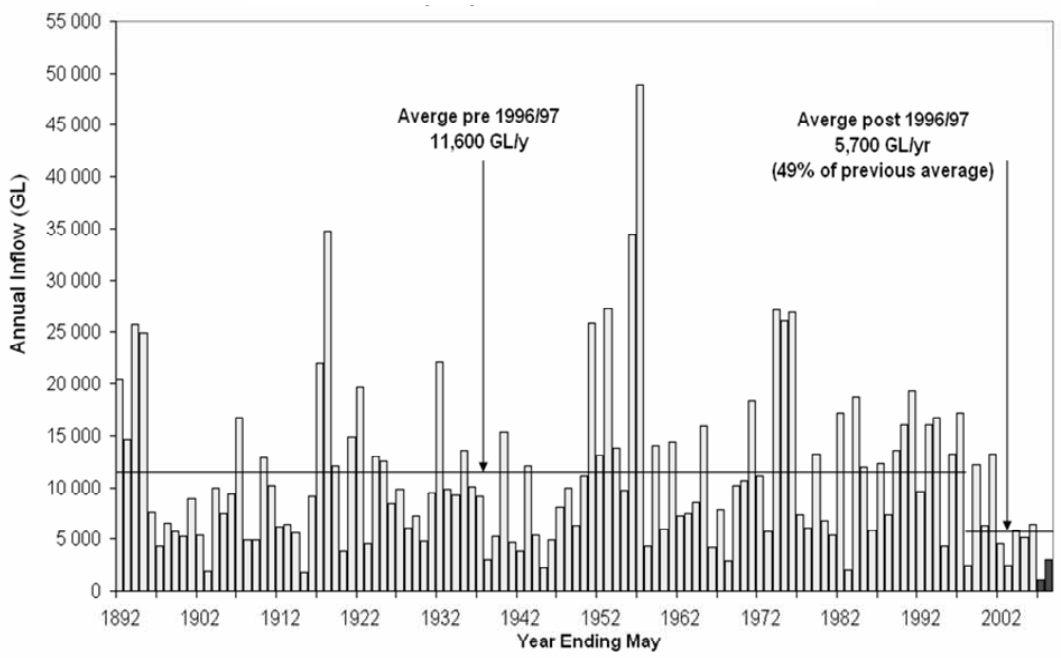
10.1 Geography and water use in the Murray–Darling Basin

The MDB covers 14 per cent of south eastern Australia, approximately one million square kilometres. Two million people live in the Basin and are dependent on it for their drinking water, as are another 1.2 million residents of the city of Adelaide, which is outside the Basin but draws its main water supply from the Murray River. Long-term average rainfall in the Basin is approximately 500 000 GL per annum, yet the vast majority does not flow into rivers. Long-term average annual runoff is 24 300 GL (5 per cent of rainfall) with approximately 11 400 GL of long-term average extractions. In the River Murray system, long-term average runoff is 11 600 GL (pre-1996–97). Conditions have, however, been significantly drier in recent years (figure 10.1). The driest year on record occurred in 2006–07 with 1040 GL of inflows, (less than 60 per cent of the previous recorded minimum inflow).

The MDB accounts for 40 per cent of the gross value of Australia's agricultural output. Only 2 per cent of MDB land is irrigated and yet this produces 70 per cent of the gross value of Australia's irrigated agricultural output. Water use in the Basin has reflected the reliability of its supply. Annual cropping, such as cotton and grain, suits the episodic water availability of the Northern Basin (as a result of extremely variable rainfall and small storages). Consequently, Northern Basin permanent horticulture relies mostly on groundwater. The Southern (Murray) system, with a historically more reliable surface water supply, supports significant permanent horticulture as well as annual cropping and irrigated pasture, including for the dairy industry.

Long-term average water diversion in the Murray system is approximately 4068 GL. There is, however, a total of 5280 GL of Murray River water entitlements. Of these, approximately 2487 GL are high-reliability water entitlements, and approximately 2793 GL are low-reliability water entitlements. The attributes of high- and low- reliability irrigation water entitlements vary between states and river valleys. On the Murray River, the long-term average allocation against the high reliability Victorian entitlement, called a 'water right', is 99 per cent. The long-term average allocation against the low-reliability Victorian entitlement, called 'sales water' is 80 per cent. Approximately 350 GL of Murray River water is used by urban and domestic consumers each year. The largest consumer of this water is the city of Adelaide (260 GL), near the end of the Murray River. Delivery of 350 GL of water for human consumption requires an extra 1000 GL approximately.

Figure 10.1 **River Murray system inflows 1891–2008**



10.2 A brief historical perspective

The MDBC is an unincorporated joint venture of four States (New South Wales, South Australia, Victoria, Queensland), the ACT and the Commonwealth Government. It was first established as the River Murray Commission in 1914, following prolonged debate between the three southern States and the Commonwealth at the time of Federation, driven by severe drought and concern about navigation and water security. Constitutional control of navigation and trade lay with the Commonwealth, while control of water lay with each State, thus the underlying challenge of reaching water management outcomes in the interest of the Basin as a whole has its genesis in the Australian Constitution.

The current Murray–Darling Basin Agreement is reflected in parallel legislation of each partner government. The Agreement and subsequent decisions of the Ministerial Council and the Commission provide the legal basis under which the Commission operates. The only sanction is 'name and shame'. Unresolved disputes are ultimately to be resolved by a Tasmanian judge.

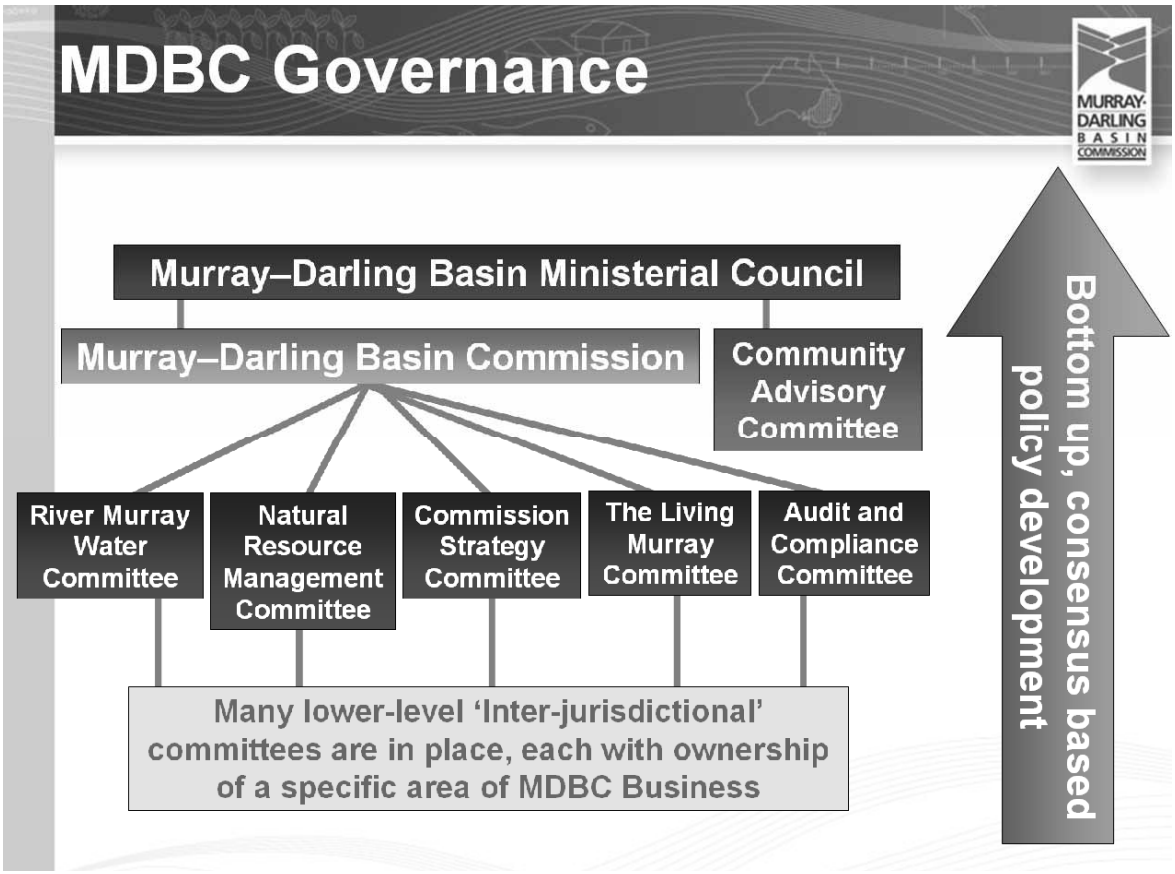
10.3 The role and structure of the MDBC

The MDBC has evolved from an agency entrusted with directing the management and operation of water storages — from Dartmouth Dam to the Murray Mouth and including the lower Darling — into a broader range of responsibilities, including environmental management and planning for the future. Its mandate, captured in the Murray–Darling Basin Agreement, is to coordinate effective planning and management of natural resources in the Murray–Darling Basin. Salinity, native fish, interstate water trade and water policy development are examples of other areas into which the MDBC's role has expanded. A Ministerial Council and a Commission of jurisdictional representatives, chaired by an independent president, oversee the organisation. The MDBC office provides the secretariat for the Ministerial Council and Commission, including administrative services, technical advice, project funding and acting as a program coordinator and facilitator of the partner governments, which deliver the on-ground projects.

An extensive network of interjurisdictional committees has developed beneath the Ministerial Council and Commission (figure 10.2), each with a technical focus on specific areas of MDBC business. Whilst these committees are not decision-making, they underpin the MDBC's inclusive and consensus-based approach by evaluating options at the detailed level and making robust recommendations to the Commission and Ministerial Council which maintain a more strategic focus. The committees and working groups also provide strong links between the policy development and on-ground project implementation of Commission and Ministerial Council initiatives. This process can be time-consuming, but it leads to far quicker and more robust decision making by the Commission and Ministerial Council. A Community Advisory Committee provides advice to both the Council and Commission and individuals participate in the advisory committees.

Under the MDB Agreement, decisions need to be unanimous to be implemented. Achieving unanimity of decisions that initiate significant new policies can be time-consuming. The original River Murray Agreement took 22 years to negotiate, and both the Cap (a limit on surface water diversions) and The Living Murray First Step each took about a decade to resolve. Once taken, however, the decisions are durable. Although the MDBC decision-making progress has been the subject of significant domestic criticism because of its lengthy gestation periods, it is highly acclaimed internationally as a successful model.

Figure 10.2 **Murray–Darling Basin Commission governance structure**



The success of the MDBC as a coordinator and facilitator is dependent on a number of factors:

- its decisions are unanimous
- jurisdictions jointly fund MDBC programs, including those implemented by the States
- the MDBC's 'river operation' and hydrological modelling functions afford traction to the environmental and natural resource management programs, policies and outcomes, which are enhanced through the cooperation and integration of 'river operations' and natural resource management programs
- the MDBC shares all information with all jurisdictions
- the MDBC fosters cooperation and collaboration with jurisdictional partners, through strong links with jurisdictions' natural resource management agencies. Jurisdictions are engaged in policy development, and the design and implementation of programs at all levels
- the MDBC has a high level of technical expertise

- the MDBC has a basin-wide focus, as opposed to the jurisdiction-centric focus of particular governments
- the MDBC commissions independent audits of all its major programs with agreed auditors.

10.4 Achieving environmental outcomes

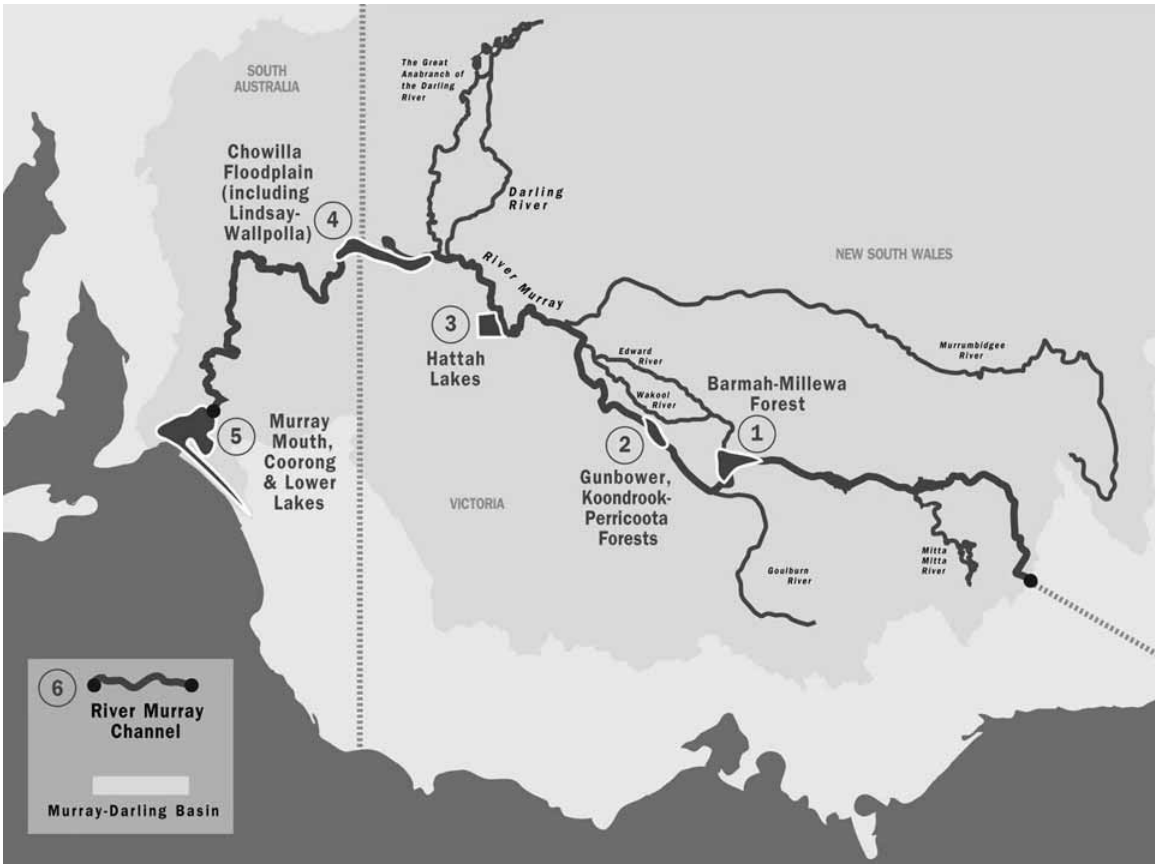
In 2002, in response to increasing evidence of environmental degradation in the Murray system, the MDB Ministerial Council requested an independent review and assessment of options to address environmental decline, combined with a comprehensive process of industry and community engagement. Since it was understood that overallocation of water (coupled with unnatural river operation) was a significant cause of environmental degradation, the independent review assessed the likely impacts of three water-recovery volumes: 350 GL, 750 GL and 1500 GL.

Significant community concern, particularly from irrigators about the method of water recovery, led the governments of the Murray system (all jurisdictions except Queensland) to provide, in August 2003, $500 million over five years for water recovery in the Murray. The Commonwealth Government contributed a further $300 million in June 2006. Strong disagreement about the value of volumetric water recovery targets alone resulted in an approach that led to the development of objectives for agreed individual Icon Environmental Sites identified by the Commission. The objectives are specific measures of fish, birds and vegetation, which provide a tangible assessment of Icon Site condition.

In November 2003, the MDB Ministerial Council took the First Step Decision to recover 500 GL of water and to achieve environmental objectives at six Icon Sites along the Murray (figure 10.3). The program was called The Living Murray (TLM) 'First Step' because it was understood to be the beginning of the river restoration process. The First Step was underpinned by an Intergovernmental Agreement (IGA), signed in June 2004, binding the governments to the objectives, water targets and financial commitments of TLM, and providing a deadline of June 2009.

Under TLM, the MDBC coordinates five programs: (1) recovering water for environmental use; (2) construction of environmental works and measures (structures and actions which facilitate the flow of water); (3) delivering water for the environment; (4) monitoring ecological outcomes; and (5) community engagement including Indigenous partnerships. The institutions, incentives and features of each program are described in order to identify success factors of multi-jurisdictional coordination.

Figure 10.3 **Living Murray Icon Sites**



Water recovery

The Living Murray First Step aims to recover 500 GL of water to improve the health of the Murray system, with an initial focus on the Icon Sites. The Southern Basin jurisdictions all contribute to the water recovery target: New South Wales (249 GL); Victoria (214 GL); South Australia (35 GL); and the Australian Capital Territory (2 GL). The targets reflect each State's consumption. The water recovery targets are a firm commitment, agreed in TLM IGA. Methods of water recovery and priorities were determined by the Ministerial Council, hence the initial focus on infrastructure over water purchases.

It is a necessarily long process to recover water, requiring a robust assessment of the volume, reliability and ultimately cost-effectiveness ($ per ML). The water recovery institutional arrangements have been established to recover cost-effective permanent water to achieve environmental objectives at the six Icon Sites. This objective is achieved by: a committee process that fosters cooperation and jurisdictional ownership of the outcomes; the expertise of the MDBC and

jurisdictional staff; and an independent review at the completion of the process. The Ministerial Council considers the outcomes of the independent review and agrees the amount that will be credited on the Environmental Water Register. These amounts contribute to those volumetric targets to which each jurisdictional government is committed.

Initially, a number of cost-effective infrastructure projects were available and there was some community opposition to market-based water recovery. But infrastructure-based water recovery projects are generally increasing in cost $ per ML, especially against the market value of a comparable water entitlement. In 2007, the MDBC Community Advisory Committee's strong statement in support of developing market-based water recovery measures was a factor in the MDB Ministerial Council's decision to pilot an environmental water purchase of 20 GL. The environmental water purchase was very successful, closing several weeks early due to high interest and over-subscription of the 20 GL target. The pilot identified a number of risks associated with water markets, including those associated with probity and due diligence.

There are currently approximately 400 GL in projects on the water recovery Eligible Measures Register. Water entitlements amounting to 133 GL have been transferred to TLM environmental water register. The significant increase in the price of permanent water in recent years is another factor that must be taken into account; infrastructure projects that were previously deemed too expensive may be reconsidered.

Construction of environmental works and measures

The strategic placement of regulators, channels and levies on the Icon Site floodplain allows more efficient delivery of TLM water to achieve environmental objectives. The Environmental Works and Measures Program (EWMP) assesses several criteria in order to achieve the greatest environmental return from investment at each of the Icon Sites, including: water requirements; cost, area of inundation; construction issues; and environmental outcomes. 'Objective' measures of cost and inundation provide a relatively easy comparison between projects and outcomes. The Taskforce also, however, looks for 'subjective' analysis of overall environmental outcomes that can be expected from the project.

Figure 10.4 **The MDBC environmental water purchase was positively reported in the media**

Farmers rush to cash in rights

Selina Mitchell

FARMERS have rushed to cash in their water entitlements, selling 20 billion litres worth under a scheme that aims to revive the Murray River.

The call for water sales has closed four weeks into an 11-week pilot being conducted by the Murray-Darling Basin Commission. About 180 irrigators have offered their water for sale, for up to $3500 a megalitre.

The popularity of the pilot is in stark contrast to a failed attempt by the Howard Government to buy water from irrigators for the environment, undertaken earlier this year. The failed scheme relied on farmers finding extra water through efficiency measures such as fixing leaky pipes, but the commission pilot simply invited irrigators to sell water entitlements at market prices.

It is this less complex purchase system that is likely to be used to deal with over-allocation under a $10 billion federal takeover of the Murray-Darling now before parliament.

The water purchased in the pilot will be used to address environmental issues at wetlands and red gum forests along the Murray.

An increasing number of irrigators are investigating the sale of their entitlements because of the drought, experts said yesterday. "They need the cash and as the dry continues, more and more people will want to sell," the managing director of Percat Water, Bob O'Brien, said.

According to the August drought report, storages in the Murray-Darling Basin are about 2000 billion litres less than at this time last year.

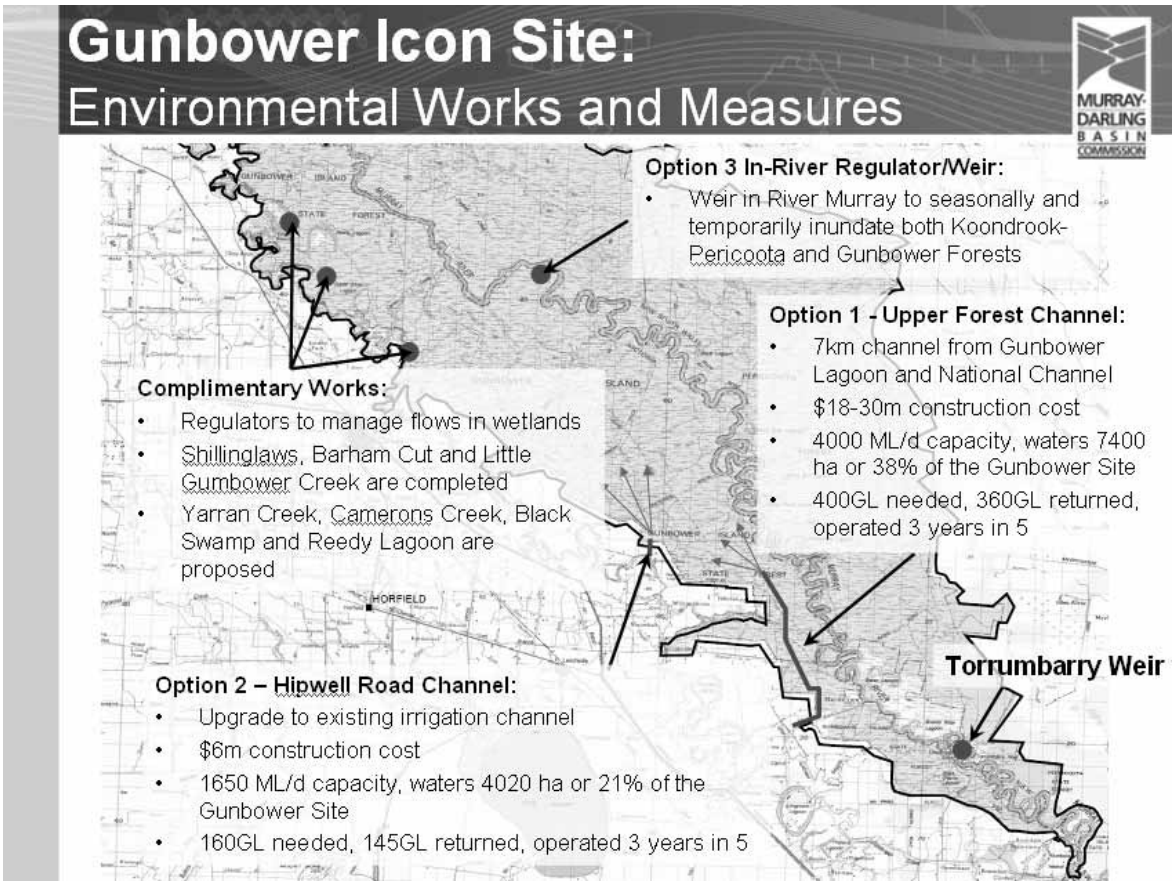
To optimise these criteria, the MDBC coordinates a 'blueprint and prioritisation' process — through the multijurisdictional 'technical' taskforce and more 'strategic' working group (under the auspices of the Commission and Ministerial Council) — which informs a holistic assessment of the projects' value for money in achieving Icon Site objectives. During this process, strong links are maintained with the partner governments, who deliver the on-ground component of the projects, and other MDBC programs. The Native Fish Strategy (to assess the impact of the structure on native fish, including the need for a fishway in floodplain works), Basin Salinity Management Strategy (to assess the impact of flooding on salt mobilisation) and River Murray Water Asset Managers (to provide feedback on design and construction, as well as ongoing operation and maintenance) are all engaged in the process.

An example is in the Gunbower Forest, where three works options vary in terms of cost, complexity, water consumption and inundation (figure 10.5).

Environmental water delivery

The environmental water delivery program is an umbrella program of TLM. It combines long-term planning to achieve the ecological objectives at each Icon Site, with an annual process to allocate available environmental water between Icon Sites.

Figure 10.5 **Options for works at the Gunbower, Koondrook, Pericoota Icon Site**



The mechanisms for long-term planning are the Murray System level Environmental Watering Plan and the Icon Site-level Environmental Management Plans, both of which are approved annually by Commission. The Environmental Watering Plan creates a framework for short-term decision making and priority-setting, which maximises the environmental outcomes across all Icon Sites. The Icon Site Environmental Management Plans provide the building blocks necessary to achieve specific Icon Site objectives. Computer modelling of environmental water delivery options is the next key input into the Icon Site Environmental Management Plans. The partner governments have developed Icon Site-specific models, which combine inundation, water depth, frequency and duration of flooding. These models are used to canvass management options for all sites, including by estimating the likely ecological outcomes from alternative flooding regimes, comparing various potential locations of environmental works on the floodplain and priority water recovery measures.

Short-term planning is conducted through the Annual Watering Plan process. The Annual Watering Plan allocates available water to Icon Sites on a needs basis according to the framework set out by the Environmental Watering Plan. This process recognises that sharing the available water equally between states will not necessarily achieve the best outcomes. The Annual Watering Plan begins with a bidding process, whereby each State Icon Site manager submits environmental watering proposals for the coming year. The MDBC supports a multijurisdictional committee, which ranks each proposal against the agreed set of weighted eligibility criteria. The result is a list of watering proposals approved by the MDBC which is sequentially implemented. The MDBC Chief Executive is delegated to approve a reordering of the list in the event of changed circumstances. But if new priorities emerge, which are not already on the list, higher level approval from the MDBC is required.

As a result of extreme dry conditions, there has been very little water available for environmental purposes (approximately 16 GL in 2007-08) and many Icon Sites are in severe stress. The MDBC has approved an interim set of ecological objectives, a clear and robust process to guide environmental water allocation, while extreme dry conditions continue. These are to: avoid loss of threatened species; avoid irretrievable damage or catastrophic events; and provide refuges to allow re-colonisation following drought.

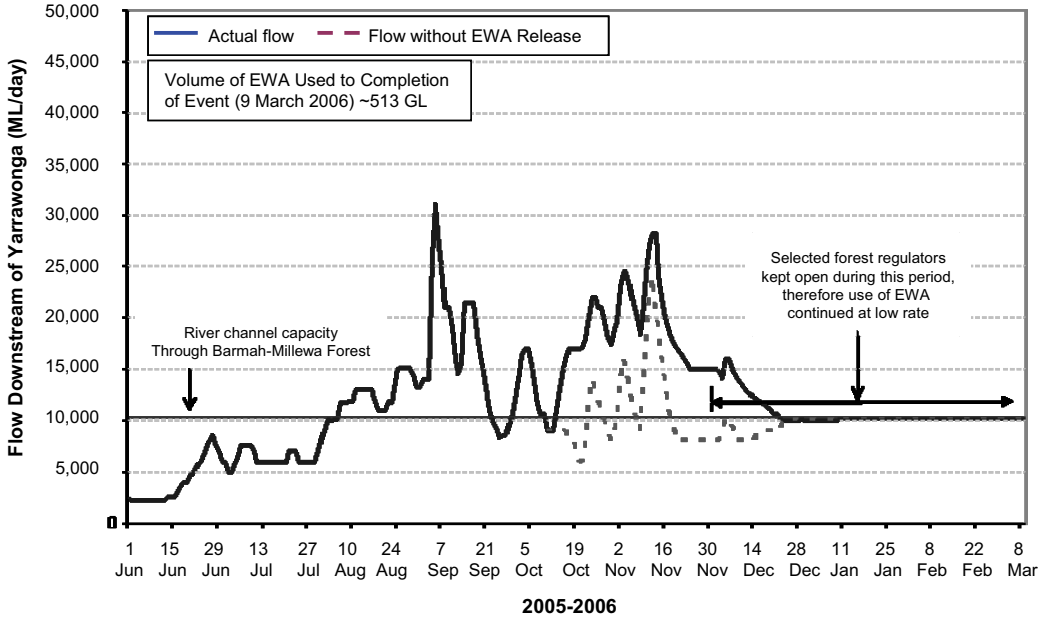
Environmental water should be delivered to the Icon Site as efficiently as possible. 'Piggybacking' an environmental flow on natural high flow is often the most efficient way to deliver water. For this purpose, the MDBC Environmental Manager is delegated to direct the release of environmental water for an approved (by the annual watering plan) purpose. In October 2005, an opportunity was identified to coordinate an environmental release from the Hume Dam with an unregulated high flow from the Ovens River. Strong links between river operations and environmental managers, both in the MDBC and partner governments, together with flexible arrangements to authorise the release of environmental water, achieved significantly greater flooding in the Barmah–Millewa Forest than would have been achieved from the environmental flows alone (figure 10.6).

Monitoring environmental outcomes

The purpose of TLM environmental monitoring program is to evaluate the progress toward the Ministerial Council-agreed Icon Site ecological objectives. TLM aims to put into practice the principles of adaptive management by using consistent methodologies for monitoring, and by establishing strong links between environmental monitoring outcomes and decision making. This will maximise

Figure 10.6 **Barmah-Millewa Forest environmental flow event, 2005–2006**

Actual flow in River Murray downstream of Yarrawonga versus probable flow without environmental release



feedback into future management practices and thereby optimise environmental outcomes.

Specific ecological objectives have been developed for each Icon Site, which address fish, birds and vegetation, for example:

- successful breeding of thousands of colonial water birds in at least three years in ten (at the Barmah–Millewa Forest)
- thirty per cent of River Red Gum forest in healthy condition (at the Gunbower and Koondrook-Perricoota Forests)
- increasing the population size and breeding events of the endangered Murray Hardyhead, Australian Smelt, Gudgeons and other wetland fish (at the Hattah Lakes).

These ecological objectives are the basis of the environmental monitoring program. In order to be effective, they must be clearly defined and consistently monitored. The MDBC has developed a monitoring framework called the Outcomes Evaluation

Framework (OEF). The OEF has been agreed by the partner governments and sets out monitoring, evaluation and reporting arrangements across the Icon Sites.

The monitoring framework gathers information at a number of resolutions:

- River Murray system-scale and Icon Site condition monitoring are designed to monitor the effectiveness of TLM at the Murray System scale and Icon Site scale respectively, during the implementation of the First Step decision.
- Intervention monitoring is designed to monitor the effectiveness of individual management interventions at the Icon Site-scale, for example the decision to pump water into an Icon Site.
- Compliance monitoring determines if management actions, particularly water delivery, are being implemented as agreed.

Collecting and analysing data at these resolutions is a key input into future decision making and the objective of adaptive management. Through the multijurisdictional Environmental Monitoring Taskforce, the MDBC coordinates analysis of the data into a monitoring synthesis, which is submitted to decision makers to inform future watering priorities and decisions.

Community consultation

TLM coordinates two forums for community and Indigenous consultation: the Community Reference Group (CRG) and Indigenous Partnerships Program (IPP). These forums aim to provide community and Indigenous input into decision-making processes, as well as to increase awareness, understanding and support for TLM programs. States also coordinate individual Icon Site consultation groups.

The IPP is beginning to engage Indigenous people in the management of Icon Sites through a process called ‘use and occupancy mapping’. The objective is to map Indigenous peoples’ contemporary relationship with the Icon Site. As part of an IPP pilot project, use and occupancy maps have been produced at two Icon Sites.

10.5 Success factors for achieving environmental results

TLM is a holistic process to maximise the environmental outcomes at the six Icon Sites. The program’s institutions and procedures have been established with a view to identifying the most cost-effective and water-efficient ways to achieve real environmental benefits at sites across multiple jurisdictions. It is proposed that the

success factors for achieving environmental outcomes in a multijurisdictional environment are:

- *Unanimity in decision making*: without agreement from all implementing parties, progress can be slowed by passive non-implementation.
- *Agreeing to clear objectives and targets, and monitoring and reporting against them*: TLM sets out agreed criteria for funding and decision making to achieve clear and tangible Icon Site-scale targets. These are underpinned by agreed approaches for monitoring and reporting. Institutionalised links between environmental monitoring and other TLM programs provide feedback on the effectiveness of individual management actions into future decisions.
- *Initial clarity of objectives and targets* rather than prescriptive process description has proven helpful in making progress.
- *Setting clear roles and responsibilities*: all TLM programs combine MDBC coordination with jurisdictional on-ground delivery of projects that often span state borders. Clear definition of roles and responsibilities is critical. TLM IGA sets out the roles and responsibilities of the partner governments with regard to objectives, targets and funding arrangements. Governance approaches have been designed to deliver against these both in the short and long term.
- *Robust processes*: throughout the long-term planning processes the TLM committees and independent reviewers canvass all options on the trade-offs required to optimise systemwide outcomes. Unanimous agreement is required throughout the committee process. Whilst this requirement may slow some decisions, a more robust outcome is achieved in the longer term. Clarity in objectives and targets, roles and responsibilities, and decision-making criteria is an important tactic against 'filibustering' in forums that require unanimity.
- *All partners make a financial contribution*: TLM IGA sets out the financial commitments of all partner governments to the programs. The programs benefit from a high level of interjurisdictional ownership and engagement with the decision-making process because all parties have a financial stake in the outcomes.
- *Adequate resourcing*: since 2006 the MDBC has had sufficient resources to enable it to provide adequate staffing and construction funds to meet objectives. As part of the coordination process, the Commission has increasingly funded jurisdictional project officers for major programs. This helps ensure that state resources are available to undertake the necessary work.
- *Independent review*: the MDBC coordinates independent reviews of many TLM work programs, including individual water-recovery measures and cost-time delivery models for EWMP. An annual whole-of-program independent audit is also conducted, which brings together all the elements of TLM, assessing issues

and risks to the delivery of the Icon Site objectives. These annual audits are presented to the Ministerial Council and made public.

- *Maximising inter-jurisdictional and interdisciplinary cooperation*: the MDBC coordinates a series of committees that support the MDB Commission and Ministerial Council. The committees provide technical and policy input, weigh up different opinions and priorities as well as providing authorisation of projects decisions of escalating cost and consequence.

10.6 Meeting future challenges

TLM was established as a river restoration project to address the impacts of long-term overallocation in the Murray System. Given an initial low level of detail and the implication of low water availability at the time of the First Step decision, significant progress has been made in the past four years. This paper describes practical institutional processes and incentives that have been implemented, using the example of achieving TLM objectives, and indicates broad success factors for achieving environmental outcomes in a multijurisdictional setting. Severe drought and critical water shortage have exacerbated environmental decline in the Murray System and restricted remedial options, forcing TLM to focus on preventing species loss and preserving drought refuges.

Under a multijurisdictional system, where there is no ability to impose action or direction, it is difficult to identify additional measures that may have been implemented. But the 'competition policy' approach of incentive payments for achievement of specific outcomes may provide another mechanism.

The obvious downside of the MDBC structure is the time- and resource-consuming nature of decision making. Jurisdictions wish to be engaged in many decisions that would normally be the prerogative of the Executive Team under a broad agreed framework. Jurisdictions recognise this problem but are loath to cede authority.

Proposed institutional change for the MDB provides the Commonwealth with a much greater role in key areas — determining sustainable river extraction limits that reflect all available water and are climate-change sensitive. Water quality and environmental watering plans for the entire Basin will be established by 2011. Institutional arrangements regarding compliance are also much more clearly defined under the new arrangements.