Australian Government

Department of the Environment, Water, Heritage and the Arts

Submission to Productivity Commission Issues Paper

Market Mechanisms for Recovering Water in the Murray-Darling Basin

16 November 2009

Introduction

The Department of Environment Water Heritage and the Arts (the Department) welcomes the opportunity to provide comments to the Productivity Commission on the issues paper *Market mechanisms for recovering water in the Murray-Darling Basin*. This submission presents information on some of the key subjects raised in the Commission's issues paper, along with an explanation of the Australian Government's *Water for the Future* initiative, the Restoring the Balance in the Murray-Darling Basin (RtB) program and the way the Commonwealth manages its environmental water holdings.

Water for the Future

The RtB program is part of the Australian Government's 10 year *Water for the Future* initiative to prepare Australia for a future with less water. *Water for the Future* has four key objectives:

- Taking action on climate change
- Using water wisely
- Securing water supplies
- Supporting healthy rivers

The Australian Government's $12.9 billion *Water for the Future* initiative comprises a range of policy and administrative reforms and programs that are helping secure water supplies for Australian households, businesses and farmers, as well as providing water to restore the health of Australia's stressed river systems. Australia's rivers and groundwater systems provide most of the water we use in our homes and to grow food and other crops. Many of Australia's river systems are under stress as a result of climate change, drought and a history of taking more for extractive use than was sustainable. More information on *Water for the Future* is at Attachment A.

For the Murray-Darling Basin, a key element of reform is the establishment of the Murray-Darling Basin Authority (MDBA). The MDBA will develop a plan to identify risks to Basin water resources, such as climate change, and will develop strategies to manage those risks. The Basin Plan is scheduled to be completed in 2011 and will include new scientifically based sustainable limits on the amount of water that can be diverted from rivers and from groundwater. Irrigation communities will need to adjust to new diversion limits as they are adopted into State water sharing plans from their respective review dates, beginning in 2012.

The RtB program is helping to smooth the transition to lower sustainable diversion limits by buying water entitlements from willing sellers and using the water allocated to them for the environment. The RtB program, together with environmental purchasing being undertaken by the MBDA and individual jurisdictions, will help restore the balance between water available for consumptive use and the environment ahead of the Basin Plan. This will help restore the health of the river system and reduce the impact on irrigation communities, who would otherwise face a much more abrupt and difficult adjustment to new diversion limits in the future.

The RtB program works alongside the Government's $5.8 billion Sustainable Rural Water Use and Infrastructure program, which supports wise use of water. Projects

under the Sustainable Rural Water Use and Infrastructure program include more than $3.7 billion of funding for significant state-based water infrastructure projects and funding for modernisation of privately owned irrigation operations in the Murray-Darling Basin. The program also includes a component to assist irrigation operators and their communities to undertake modernisation planning. Nearly $5 million has been provided for this purpose. Further information on the Sustainable Rural Water Use and Infrastructure program is at Attachment B.

Water entitlements secured through water purchasing and water recovery dividends from infrastructure investments become part of the Commonwealth's environmental water holdings. These entitlements are transferred to the Commonwealth Environmental Water Holder (CEWH), which manages the holdings to protect or restore the environmental assets of the Murray-Darling Basin.

Integration of water purchasing and infrastructure investments

The water purchasing and infrastructure programs work in a coordinated way to help irrigation communities adjust to a future where less water will be available. On the one hand, selling water to the Commonwealth provides an opportunity for irrigators to restructure their businesses in response to factors such as climate change, expected changes in water sharing arrangements, changing market conditions or other drivers affecting the profitability of their business. Investment in infrastructure is aimed at increasing water use efficiency, helping irrigators derive more value from a smaller pool of available water resources.

Irrigation Modernisation Planning helps irrigation operators to identify areas where there is a case for new, fit-for-purpose infrastructure investments and areas where there is a case to facilitate closure of a part of an existing district. Irrigation modernisation planning funded under Water for the Future thus far accounts for more than 75 per cent of entitlements held in irrigation schemes in the Murray-Darling Basin. With the first tranche of these plans now complete, the Australian Government is able to offer assistance to support infrastructure upgrades or to receive proposals to rationalise parts of an existing system should a proposal along these lines be agreed between the irrigation water provider and the affected irrigators. Irrigation scheme operators are currently preparing applications for funding to undertake both infrastructure upgrades and rationalisation activities.

Proposals for rationalisation can be funded through the Irrigator-led Group Proposal program, or through infrastructure investment programs such as the Private Irrigation Infrastructure Operators program in NSW. These programs will provide for the acquisition of water entitlements at market price and can provide funding to reshape existing infrastructure to position properties for dry land agriculture, for example to provide an alternate stock and domestic water supply.

Proposals for rationalisation may involve major changes for irrigation communities and require full community engagement and support. For this reason, the pace at which proposals develop is necessarily slow as they need to be underpinned by robust planning and gain agreement from all participants. By contrast, selling water entitlements through water tenders provides individual farmers with an immediate

way to capitalise and rebalance their assets, while also providing immediate benefits for the environment through environmental watering.

The Restoring the Balance in the Murray-Darling Basin program

Purchasing water entitlements ahead of the Basin Plan supports immediate action to address critical environmental water needs in the MDB. Waiting for the Basin Plan to be completed before purchasing would risk the collapse of stressed ecosystems which rely on water flowing through the MDB's rivers and tributaries. Purchasing water ahead of the Basin Plan also reduces the impact on irrigation communities, who would otherwise face a much more abrupt and difficult adjustment to the expected lower diversion limits in the future.

Prior to finalisation of the Basin Plan, the Department is drawing upon best available science to establish purchase priorities and make purchasing decisions. This includes the CSIRO Murray Darling Basin Sustainable Yields Project, the former Murray-Darling Basin Commission's Sustainable Rivers Audit and existing water management plans. The Department also liaises with state government and water management authorities in setting purchasing priorities.

Approach to purchasing

Water entitlements are being purchased using a conservative 'no regrets' approach ahead of the Basin Plan being introduced. This is being done by directing purchases to catchments with the highest environmental need whilst also ensuring that water is not acquired in excess of the estimated reduction in diversions required by the new lower sustainable diversion limits expected in the Basin Plan. Environmental needs are determined using the best available science from a range of information sources.

Water entitlements are purchased from sellers on the basis of overall value for money according to the following criteria:

1. the entitlements offered can provide water in catchments where there is scientific evidence that water needs to be recovered for the environment;
2. there is a capacity to deliver water from these entitlements for an environmental benefit; and
3. the costs of purchasing the entitlement are judged to represent value for money.

Under the no-regrets approach the volumes purchased are further refined to take into account the existence of delivery constraints which might diminish the environmental benefits which can be gained from an entitlement; the volume of environmental water recovered or expected to be recovered by other Australian Government and state government programs, including expected environmental water recovery through the Australian Government's Sustainable Rural Water Use and Infrastructure program.

Given the budget available for water recovery under the Water for the Future plan is unlikely to be sufficient to meet all environmental water recovery requirements in the

MDB, it is important that the Australian Government's water recovery efforts are directed to those catchments with the highest priority environmental needs. Applying this criterion to the 2008-09 tenders resulted in around ninety per cent of purchases being made in high priority catchments.

As part of the environmental prioritisation process, some catchments and entitlements have not been considered for purchasing for various reasons. In some cases, current institutional arrangements prevent the effective delivery of environmental water to identified ecological assets (e.g. water trading restrictions, unregulated systems, or lack of water sharing plans). Physical channel constraints may also limit the total volume of environmental water that can be delivered to an asset. Some catchments have also been identified as low priority for water purchasing because they have low levels of development and consumptive extraction, they are not known to contain environmentally significant assets or they have low environmental water needs.

A mix of entitlement types has been purchased under the RtB program. This allows for dynamic watering to satisfy the varying physical conditions and needs of ecological assets in the MDB. For example, high security entitlements provide more reliable water allocations which can be beneficial to water environmental assets during extreme dry periods. On the other hand, low security entitlements receive allocations during periods of high rainfall, which may be used to add to large flow events so as to facilitate an over-bank flooding event to inundate a floodplain.

The RtB program has focused on acquiring permanent water entitlements, rather than temporary water allocations. This is because the Government believes that acquiring permanent water entitlements provides the best option to secure lasting environmental benefits and permanently re-balance water use in the MDB. Other Australian and state government water purchasing initiatives may choose to acquire temporary water to meet short term environmental needs. For example, in March 2008 the former Murray Darling Basin Commission purchased 11,000 megalitres of temporary water to boost natural watering in the Narran Lakes.

Purchases in the northern Basin

There are additional challenges to purchasing water for the environment in the northern Murray Darling Basin compared to the southern Basin. One reason for this is that there are more unregulated water entitlements in the northern Basin which have variable characteristics in terms of the rate that water can be pumped from the river, the river level for commencing pumping and the location for use. By comparison, regulated entitlements in the southern Basin have relatively homogenous access conditions meaning that offers are more easily compared on a value for money basis.

An additional challenge to purchasing water entitlements in the northern Basin is that the market is very thin. This makes it difficult for potential applicants to find price information to help determine an appropriate offer price, as well as for the Department to set benchmark prices for the assessment of offers. The Department has engaged the services of independent valuers to assess water entitlement values in these regions to assist in setting its benchmark prices.

In some northern Basin catchments, water can not be purchased separately from land because a Resource Operations Plan or Water Sharing Plan has not been completed. This includes the lower Condamine-Balonne, which was one of four catchments identified as being a high priority target for the program at the beginning of the 2008-09 tender. Catchments are identified as a high priority if they contain numerous high value environmental assets; have high levels of water resource development; and are known to have additional watering needs to maintain or improve environmental assets.

As opposed to the situation in the southern Basin, where water can be directed to environmental assets as part of normal river operations, when water is purchased in the northern Basin water, shepherding is required to ensure that environmental flows reach target environmental assets. The Department has set up a Water Holdings and Shepherding Section to work with jurisdictions to develop water shepherding arrangements that protect environmental water from diversion by consumptive users in unregulated rivers. These arrangements will provide the capacity to optimise the use of the water for the environment, through protection of in-stream environmental flows and delivery of water to high priority environmental assets, without enhancing or diminishing the rights of other water users. The Commonwealth is currently pursuing bilateral water shepherding agreements with New South Wales and Queensland.

Water purchase tenders

Purchase mechanism

The principal mechanism adopted for the 2007-08 and 2008-09 rounds of water purchasing was a rolling tender in which potential sellers submit price and volume offers and the bids are assessed on an ongoing basis against environmental and value for money criteria.

A review of the 2007-08 water tender, conducted by Hyder Consulting, endorsed the rolling tender as a highly favourable method of conducting transactions. Hyder Consulting noted that a rolling tender has a number of benefits including that bids are only accepted from sellers voluntarily offering their water for sale, value for money is achieved by not disclosing more information than is needed to receive bids and compliance costs are minimised for non-successful bidders. Other key benefits of a rolling tender are that administration is relatively straightforward and that unsuccessful bidders receive feedback in a relatively short period of time, enabling them to resubmit an offer at a lower price.

The tender is complemented by additional water recovery mechanisms, including irrigator-led group proposals, land and water purchases and the Small Block Irrigators Exit Grant Package.

Application process

Applications received by the Department through the RtB program are assessed for value for money by an internal evaluation committee according to the three criteria outlined in the section above. Further information on the assessment criteria used is provided at Attachment C.

If the Department decides to pursue an application, the applicant is notified of the result and the Department initiates conveyancing by the Department's appointed solicitor. The conveyancing process includes: due diligence checks; exchange of contracts; approval by relevant water authorities; settlement; and registration of the transfer. The details of these steps are outlined in Attachment D.

Due diligence checks are undertaken on each water entitlement that the Commonwealth is pursuing for purchase, to validate the information provided by the seller in their application and to check for any issues that might affect the value for money of the trade.

Due diligence checks confirm ownership details of the entitlement, thereby ensuring that the person offering the entitlement for sale has the legal right to do so. Due diligence checks also confirm that there are no undisclosed encumbrances on the licence, such as a Snowy Borrow debt or a long-term allocation lease, which may impact on the Commonwealth's capacity to fully utilise the water entitlement once it has been transferred into the Commonwealth's ownership. In addition, the characteristics of the entitlement being offered for sale is checked to confirm that the entitlement was correctly described by the seller, is tradable separate from land and that water allocations against the entitlement are able to be delivered by the Commonwealth Environmental Water Holder.

The time taken to complete the conveyancing process varies between states due to differences in trade approval requirements. There have been delays in the processing of some applications, primarily as a result of state government restrictions on water trading. For instance, applications in NSW were delayed by the four month embargo on environmental water purchases. As in other years, processing of applications was delayed in Victoria as the Department had to wait for the 2009-10 ballot to see if the accumulated trade approvals would be approved within the allowable net trade under the Victorian four per cent rule. Some trades in Victoria were also delayed by the ten per cent rule restricting trades which could be separated from land. Some trades in South Australia were also delayed while new water trading arrangements were introduced by the state government in the middle of 2009.

Many of the impediments to the efficient processing of trades have now been overcome. The NSW Government recently signed a Memorandum of Understanding providing for a lifting of embargo on environmental water purchases, albeit with an annual 'ceiling' on the volume of such trades to the Commonwealth. The Memorandum of Understanding allows for the backlog of trades in NSW to be cleared. An agreement has also been reached with the Victorian government to allow more environmental water purchases in Victoria. That agreement is expected to provide for at least 460 GL of environmental purchases from Victoria from 2008-09

to 2012-13. Of this, 300 GL will be trades allowed 'above the cap' in districts where the four per cent rule currently applies. Exemptions are to be granted in a way that is consistent with the modernisation of irrigation districts through the Northern Victorian Irrigation Renewal project.

The Department is making improvements to its own internal processes to reduce the time taken to process applications.

Outcome of water purchasing activities in 2007-08 and 2008-09

As at 30 September 2009, the Restoring the Balance program had secured the purchase of 612 GL of water entitlements valued at $947 million. These entitlements are expected to yield an average of 395 GL of water per year for the environment. Attachment E provides details of exchanged contracts as at 30 September 2009. Information on the outcomes of the RtB program is regularly updated on the Department's website.

The majority of offers received during the tender rounds were from regulated river systems for which market prices are well known and where the water storage is located upstream of high priority environmental assets. For these reasons, the rejection rate of offers to the RtB program, other than due to oversubscription, was generally low.

Approximately 25 per cent of the volume of purchases to date has been of High Security entitlements and 61 per cent has been of General Security entitlements. Almost all of the water has been purchased in catchments which received a poor or very poor health rating from the Murray-Darling Basin Commission's Sustainable Rivers Audit.

Around 90 per cent of purchases have come from three of the four catchments identified as being high environmental priorities – Gwydir, Macquarie and the southern connected Murray system. Purchases have not been made in the other high priority catchment, the Lower Condamine-Balonne, because entitlements are not yet tradeable from land and in any case no value for money sell offers were received.

How environmental water is used

Water entitlements recovered through the RtB program and the Sustainable Rural Water Use and Infrastructure program form part of the Commonwealth environmental water holdings. These holdings are managed by the CEWH to protect or restore environmental assets and give effect to relevant international agreements. The holdings must also be managed in accordance with the Environmental Watering Plan under the Basin Plan once it is developed. More information on the management and use of Commonwealth environmental water is provided in Attachment F.

In 2008-09 the CEWH allocated a total of 10.9 GL from a combination of Commonwealth water entitlements and water recovered from the purchase of Toorale Station to 10 wetlands in New South Wales, Victoria and South Australia. The watering that was undertaken generally aimed to protect mature River Red Gum

communities, pockets of healthy ecosystems in drought affected floodplains and wetlands, and refugia for threatened species.

The Department has released a discussion paper on determining Commonwealth environmental watering actions to relevant stakeholders which is available on the Department's website for comment. The discussion paper is provided at Attachment G.

Approach to future water entitlement purchasing

The acquisition of water entitlements will continue to be conducted in a way that seeks to maximise environmental outcomes and value for money. Prior to completion of the Basin Plan, water purchasing will continue to be guided by the Department's 'no regrets' approach, using the assessment criteria outlined above. Decisions refining the focus of the program in terms of priority environmental water purchases will take into account indicative environmental water recovery requirements; new information on environmental water recovery requirements as it comes to light; and the outcomes of the purchase program to date.

The Department is likely to review the approach to purchasing, particularly the environmental watering priorities guiding purchase decisions, when the proposed Basin Plan is released in 2010. This is expected to be a major addition to the body of public information on environmental watering needs in the MDB and is expected to underpin further refinements to the purchasing strategy adopted for the RtB program.

Assisting structural adjustment

Selling water to the Australian Government provides a cash injection for irrigators which may be used to adapt their businesses to better suit continuing dry conditions through investment in farm upgrades or diversification. It enables others to exit the industry altogether. Regional benefits may be created where the funds received by irrigators are reinvested in the local economy. An independent assessment of the first phase of the RtB program undertaken by Hyder Consulting in 2007-08 confirmed these benefits for irrigators and the regional communities involved.

As outlined earlier in this submission, significant investments in infrastructure to assist irrigation communities to adjust to reduced water availability are being made through the Sustainable Rural Water Use and Infrastructure program..

Small Block Irrigators Exit Grant Package

The Small Block Irrigators Exit Grant Package was designed to assist small block irrigators in the MDB affected by drought and climate change to exit the irrigation industry, while remaining in their communities. The package also provides an advice and training grant to assist recipients prepare for the future and transition into alternative employment. The package contributes to water recovery objectives as applicants were required to sell water entitlements to the Commonwealth to be eligible. The exit grant is provided as a separate payment, managed through Centrelink, and is not funded through the Restoring the Balance program.

The total volume of water acquired from exit grant recipients is low compared with the total volume of water recovered through the water tender. To date, contracts have been exchanged or settled for approximately 6 GL of water entitlements from Small Block Irrigators Exit Grant Package applicants. Around 14 GL is expected to be recovered in total through the exit grant package.

The market for water

While recognising that the Commonwealth is a major buyer of water entitlements in the MDB through the RtB program, the Commonwealth aims to minimise its impact on water entitlement prices by setting the program's benchmark prices with reference to prevailing market prices. This also helps to minimize the impact on other buyers, including irrigators and farmers.

The price the Department is willing to pay for water entitlements can change over the both between tender rounds and within tender rounds. The Department accepts offers from sellers provided the price nominated by the seller is at or below the RtB program's currently acceptable 'benchmark' price. Sellers whose offers are rejected on the basis of price are able to resubmit new sell offers to the program.

The RtB program provides an additional selling option to sellers, particularly in catchments where there is little trading in water entitlements or where trading has only recently commenced.

Reporting price information

The Department reports on its website the average prices paid for water entitlements, by catchment, which are purchased through the RtB program. The Department also reports on its website quarterly summaries of market prices in the MDB. This information is provided to help irrigators and others to access price information and to make informed judgements about water entitlement sell offers. Price information for trades completed under the RtB program is also made available on state registers, as it is for other buyers.

The Department does not publicly release the current price it is prepared to pay for water entitlements. Releasing the current acceptable price could jeopardise the Department's capacity to secure value for money purchases.

Impediments to the use of particular market mechanisms

The Australian Government is working with state governments to pursue reforms to ensure that the water market operates as openly and efficiently as possible. The Government believes that the irrigation industry, the community and the environment are best served by water being freely traded, to allow it to move to its highest value uses.

Barriers to open trade, such as the NSW embargo and application of the four per cent limit in Victoria, can restrict the movement of water to its highest value use, including the environment. Trade restrictions can also severely disadvantage potential sellers of water, by denying them access to funds and hampering their

business management. For the RtB program, state trade restrictions entail additional administrative costs and result in substantial delays in the processing of purchases.

For instance, purchases under the RtB program are counted towards the four per cent limit in each northern Victorian irrigation district. Once the four per cent limit is reached, trade approval for further purchases is not granted unless the trades are deemed by Victoria to be eligible for exemption under the 'Water for the Environment' Agreement. In 2008-09, the four per limit was reached in eight out of ten irrigation districts in Victoria for high reliability class water, and in five irrigation districts for low reliability class water, leading to the rejection of a number of Australian Government purchases.

Already in the current water year (2009-10), the limit has been reached in five districts for high reliability water (Central Goulburn, Murray Valley, Pyramid-Boort, Torrumbarry and Robinvale, Red Cliffs, Merbein) and one for district for low reliability (Murray Valley). So far in 2009-10, trade approval for Australian Government purchases worth in excess of $80 million has been denied due to the operation of the Victorian four per cent rule.

The 'Water for the Environment' agreement between the Australian and Victorian Governments provides for at least 460 GL of environmental purchases from Victoria in the period up to 2012-13. Of this, 300 GL can be acquired above the four per cent limit through an annual exemption of 60 GL provided by Victoria. A timetable has been set for the complete removal of Victoria's four per cent limit on trade. As part of this agreement, the 10 per cent cap on the ownership of entitlements by non-landholders in Victoria has already been removed.

Termination Fees

The termination fee rules which came into full operation on 1 September 2009 strike a reasonable balance between providing investment certainty for operators and flexibility for irrigators. More information on the application of termination fees in the Murray-Darling Basin and the impact of the water market and termination fee rules can be found in the Regulation Impact Statement (RIS) for the rules. The RIS is contained in the Explanatory Statement to the rules and is available on the Federal Register of Legislative Instruments website - www.frli.gov.au

Transaction Costs

High transaction costs associated with trading water entitlements are contributing to inefficiencies in market performance. Australian and state government agencies are working to address this situation by increasing pricing and information disclosure, streamlining transaction processes and reducing trade processing times.

In particular, COAG has agreed to the development of a National Water Market System (NWMS). The objective of the NWMS is to improve the functioning of the water market in Australia by facilitating the flow of information on water entitlements, allocations and trade between all market participants, and supporting

timely and low-cost water transfers across irrigation area boundaries and state borders.

The NWMS is being developed by the Department in conjunction with the states and territories, over a three-year period.

The proposed NWMS will have several elements, including:

- a National Portal – a web-based portal to provide access to new summary market information and to existing state and territory information; over time, subject to cost benefit analysis, the Portal could also provide an access point for initiating transactions
- the development of a Common Registry System (to be implemented in New South Wales, South Australia, Western Australia, Tasmania, the Northern Territory and the Australian Capital Territory) and enhancements to existing register systems in Victoria and Queensland
- Inter-operability between registers to facilitate more efficient interstate trade.

Procurement guidelines

Market mechanisms for purchasing water need to adhere to Commonwealth Procurement Guidelines (CPGs) which establish the core procurement policy framework and articulate the Government's expectations for all Departments and Agencies in relation to procurement. These guidelines can be accessed on the Department of Finance website: http://www.finance.gov.au/publications/fmg-series/procurement-guidelines/index.html

Value for money is the core principle underpinning the CPGs. This requires a comparative analysis of all relevant costs and benefits of each procurement throughout the whole procurement cycle. It is achieved by:

- encouraging competition by giving all potential suppliers the same opportunities to compete for government business and to be treated equitably based on their legal, commercial, technical and financial abilities;
- promoting the use of resources in an efficient, effective and ethical manner by using resources to achieve the maximum value for the resources used, and selecting a procurement process that is consistent with government policy and is the most appropriate to the procurement objective under the prevailing circumstances; and
- making decisions in an accountable and transparent manner by ensuring that any procurement process is open and transparent and that decisions are justified. Agencies need to have in place procedures to ensure that procurement processes are conducted soundly and that procurement related actions are documented, defensible and substantiated in accordance with legislation and government policy.

ATTACHMENT A

WATER FOR THE FUTURE

The Australian Government's is investing $12.9 billion in *Water for the Future* – a 10-year plan to prepare Australia for a future with less water. *Water for the Future* has four key priorities:

- Taking action on climate change
- Using water wisely
- Securing water supplies
- Supporting healthy rivers

The *Water for the Future* initiative will help secure water supplies for Australian households, businesses and farmers, as well as providing water to restore the health of Australia's stressed river systems.

1. Taking action on climate change

The Australian Government is preparing our water resources for the impacts of climate change by:

- Accurately monitoring, assessing and forecasting water resources are being addressed through the $450 million Improving Water Information program.
- Establishing the Murray-Darling Basin Authority (MDBA) which will develop a Basin-wide plan to identify risks to Basin water resources and develop strategies to manage those risks.

2. Using water wisely

Wise use of water is being encouraged through:

- Investing in key rural water projects that save water by upgrading out-dated, leaky irrigation systems under the $5.8 billion Sustainable Rural Water Use and Infrastructure Program
- Providing $250 million through the National Rainwater and Greywater Initiative to help households and surf lifesaving clubs save precious drinking water by installing rainwater tanks and greywater systems
- Supporting businesses with high water usage to be more water-wise through the Water Efficiency Opportunities Program.

3. Securing water supplies

Climate change is reducing rainfall across much of Australia. To combat this reality, *Water for the Future* is helping towns and cities secure their water supply by:

- Investing $1 billion through the National Urban Water and Desalination Plan to support desalination, water recycling and stormwater reuse and reduce our reliance on traditional rainfall.
- Funding practical projects like pipelines, water saving infrastructure and water treatment plants, through the $250 million National Water Security Plan for Cities and Towns

4. Supporting healthy rivers

Australia's rivers and groundwater systems provide most of the water we use in our homes and to grow food and other crops. Many of Australia's river systems are under

stress as a result of climate change, drought and a history of taking too much water out of the rivers.

Water for the Future is improving the health of our important rivers by:

- Buying back water entitlements from sellers under the $3.1 billion Restoring the Balance program
- Setting a new, scientifically informed cap on the amount of water that can be taken out of rivers and groundwater systems in the Murray-Darling Basin through the Murray-Darling Basin Plan.

ATTACHMENT B

RURAL USE AND INFRASTRUCTURE PROGRAM

The Sustainable Rural Water Use and Infrastructure program invests in key rural water projects that support sustainable irrigation communities and that save water by upgrading out-dated, leaky and inefficient irrigation systems.

The program comprises a range of initiativesincluding:

- State Priority Projects agreed in the July 2008 Intergovernmental Agreement on the Murray-Darkling Basin
- Irrigation Modernisation Planning Assistance program
- On-Farm Irrigation Efficiency Program
- On-Farm Irrigation Efficiency (Pilot Projects) Program
- Private Irrigation Infrastructure Operator Program in NSW
- Menindee Lakes and Aquifer Recharge
- Water Meter Test Facility Upgrading and Accreditation

The Irrigation Modernisation Planning Assistance helps irrigation water providers todevelop modernisation plans for their districts and assess options for rationalising and upgrading infrastructure to adapt to a future with less water.

The On-Farm Irrigation Efficiency Program ($300 million)is aimed at assisting irrigators in the Lachlan and southern connected system of the Murray-Darling Basin to modernise their on-farm irrigation infrastructure while returning water savings to the environment.

The On-Farm Irrigation Efficiency (Pilot Projects) Program is testing delivery models for acquiring water savings from future on-farm works programs. The experience and information gained will help inform how the Australian Government will work with irrigators in the future.

The Private Irrigation Infrastructure Operators Program in New South Wales delivers on a commitment made under the Inter-governmental Agreement on Murray-Darling Basin Reform. Under the agreement, the Australian Government committed to provide up to $650 million to private irrigation infrastructure operators in New South Wales to modernise and upgrade irrigation infrastructure.

The program aims to acquire water entitlements resulting from water savings generated by projects that improve the efficiency and productivity of water use and management, both off and on-farm, by private irrigation infrastructure operators. The program will also help secure a sustainable future for irrigation communities.

The Australian Government has made a commitment to invest up to $400 million to reduce evaporation and improve water efficiency at Menindee Lakes; secure Broken Hill's water supply; protect the local environment and heritage; and return up to 200 gigalitres (GL) per year to the environment.

The Australian Government supports more accurate water metering through its investment in State Priority Projects.

ATTACHMENT C

PURCHASING DECISION FRAMEWORK

The decision to accept water entitlements offered for sale through the RtB program has been undertaken using the following criteria:

1. The entitlements offered can provide water in catchments where there is scientific evidence that water needs to be recovered for the environment.

2. There is a capacity to deliver water from these entitlements for an environmental benefit.

3. The costs of purchasing the entitlement are judged to represent value for money.

These criteria were developed to ensure that the environmental benefits of the program are maximised against a widespread environmental need for more water, and a substantial but limited purchase budget.

Environmental need

Prior to the Murray Darling Basin Authority (MDBA) developing a Basin Plan to guide environmental watering priorities in the Murray Darling Basin (MDB), decisions about environmental need are made using best available science including the CSIRO sustainable yields report; the MDBC Sustainable Rivers Audit and other information on specific high value ecosystems. New information is added to the mix as it becomes available.

Environmental need is prioritised for individual catchments as high, medium or low. Catchments are ranked as high which have: numerous high value environmental assets; high levels of water resource development; and known additional watering needs to maintain or improve environmental assets. In directing purchases in this manner there is scope for addressing historical over-allocation.

Water purchases have been directed to high and medium priority catchments. No purchases have been made in low priority catchments. A list of priorities assigned to catchments in the MDB using best available science is provided in Table 1.

Table 1: Catchments prioritisation

Higher priority catchments	Southern connected Murray system Lower Condamine-Balonne Gwydir Macquarie
Moderate priority catchments	Border Rivers Barwon – Upper Darling Lachlan Upper Condamine Namoi
Lower priority catchments	Moonie Paroo / Warrego Castlereagh

Capacity to deliver

Another issue which is considered in deciding on which entitlements to purchase is the capacity of the CEWH to use the water entitlements being offered for sale, which includes:

- The management arrangements and infrastructure required to deliver and use the water entitlement for environmental benefit.
- Whether the entitlement is able to provide water when it is needed.
- Possible water losses through seepage, evaporation and extraction by other licensed users.
- The relevant state legislation and water sharing plan which govern the use of the water entitlement and provide security over the property right.

In determining capacity to deliver environmental water, a risk assessment is undertaken for common entitlement types in the MDB (these risks are summarised in Table 2). Only entitlements that are rated as a low or moderate risk are accepted for purchase.

Table 2: Risk assessment of capacity to deliver

Entitlement type	Risk	Rank (0-2)
• Overland flow licence remote from large volume channel • Small volume channels, particularly when separated from a high value environmental asset by a dam (unregulated rivers in NSW and regulated and unregulated rivers in Queensland)	High	0
• Unregulated entitlements in Macquarie and Gwydir • Queensland overland flow licence adjacent to large volume channels • Large volume channels (unregulated rivers in NSW and regulated and unregulated rivers in Queensland)	Moderate	1
• Entitlements located upstream of high priority environmental assets where water is likely to flow for environmental benefit even in the absence of water management arrangements • NSW, Victorian and South Australian regulated entitlements	Low	2

The Australian Government has purchased a mixture of high and general security water in order to cater for the different watering needs of environmental assets.

Cost of entitlements

The Australian Government accepts sell offers of water entitlements based on a discriminatory price tender. Publicly reported market prices are used as a reference point to set a price benchmark. This benchmark is the basis on which the Australian Government discriminates between sell offers, accepting only those offers for which prices are at or below the benchmark. Where water markets are immature and/or little trade has occurred, as is the case in the northern Basin, the Australian Government

has engaged the services of accredited valuers to develop a better understanding of market prices.

In assessing the cost of pursuing a water purchase, the Government takes into account the price of the sell offer, the transaction costs associated with the purchase, and the current estimate of the costs incurred in delivering water to the target environmental asset.

The prices the government is willing to pay for water entitlements are adjusted according to factors such as market price movements, reliability of entitlements, expected environmental benefits and the cumulative volume of purchases that have been made in each catchment.

ATTACHMENT D

CONVEYANCING PROCESS

- The first step in the conveyancing process is **due diligence**. A due diligence report is prepared by the Department's appointed solicitor to validate the information submitted by the successful applicant (seller) in their application and to check for any issues that may affect the value for money of the offer.
- Provided the due diligence process does not identify any issues which affect the value of money of the offer, a **sale contract is prepared**. If relevant issues are identified more information may be sought from the seller or negotiations are entered into to resolve the issues.
- **Contracts are then signed and exchanged** between the Department and the seller. Once the contracts are signed by both parties, a signed copy is returned to the seller for their records.
- On exchange of contracts the sale of the water entitlements offered becomes binding and forms are **lodged with relevant authorities** to transfer ownership of the entitlements.
- If **approval by the relevant water authorities** is given to the transfer of ownership, a settlement date is set. If approval is not granted by the relevant water authority, the sale does not proceed, as per the conditions of the contract.
- If approval is granted by the relevant water authority, a **settlement statement** is prepared for approval by the Department and the seller. **Settlement** of the transaction includes the payment being made to the seller, and the Department receiving the necessary documents to record ownership of entitlements.
- **Registration** is completed upon receipt of the certificate of title or notice that the Governments ownership of the water entitlement has been recorded.

ATTACHMENT E

Purchases secured under the Restoring the Balance program as at 30 September 2009						
Catchment	**Entitlement Type**	**2007-08 Purchases (ML)**	**2008-09 Purchases (ML)**	**Expected average annual volume of water available for the environment (ML)**	**Average price paid per trade 2008-09 ($/ML) [b,c]**	**MDBC Sustainable Rivers Audit Health Rating**
QLD Border Rivers	Medium Priority		5,325	1,757	$2,300	Moderate
QLD TOTAL			**5,325**	**1,757**		
Gwydir	General security	2,916	67,622	25,394	$2,245	Poor
	Supplementary		16,744	3,181	NA	
Barwon-Darling [a]	Unregulated		28,603	28,603	NA	Poor
Namoi	General security		4,805	3,700	$2,033	Poor
Macquarie	General security	884	53,365	22,785	$1,248	Very Poor
	Supplementary		1,888	397	NA	
Lachlan	High security	300		300		Very Poor
	General security	7,214	71,905	33,230	$685	
Murrumbidgee	General security		47,606	30,468	NA	Very Poor
	Supplementary		20,820	2,915	NA	
NSW Other	Various		475	471	NA	
NSW TOTAL (includes Murray)		**16,264**	**425,218**	**245,673**		
Campaspe	High reliability	635	3,038	3,489	$2,380	Very Poor
Goulburn-Broken	High reliability	650	60,025	57,641	$2,362	Very Poor
	Low reliability	370	4,811	1,813	$185	
Ovens	High reliability	50		48	NA	Poor
VIC Other			392	252	NA	
VIC TOTAL Includes Murray)		**7,662**	**140,955**	**132,670**		
Murray	VIC Above Choke - High reliability	5,104	23,751	27,412	$2,166	Poor - Very Poor
	VIC Below Choke - High reliability	543	41,801	40,227	$2,369	
	VIC Above Choke - Low reliability	160	3,700	926	$179	
	VIC Below Choke - Low reliability	150	3,438	861	$200	
	NSW General security - above choke [d]	1,780	97,095	80,089	$1,317	
	NSW General security-below choke	3,170	14,289	14,142	$1,273	
	SA High security	427	16,008	14,791	$2,385	
SA TOTAL		**427**	**16,008**	**14,791**		
TOTAL		**24,353**	**587,506**	**394,891**		

(a) Includes the water entitlements acquired from Toorale Station.

(b) The average prices displayed are not necessarily an indicator of the current price the Australian Government is willing to pay for water entitlements. This is because the prices the government is willing to pay for water entitlements are adjusted according to factors such as market price movements, reliability of entitlements, expected environmental benefits and the cumulative volume of purchases that have been made in each catchment. The average prices displayed reflect consideration of these factors at the time applications were accepted, which may be some months prior to the time contracts were exchanged.

(c) Purchasing information, including average price paid per trade, is only provided for catchments where contracts have been exchanged with five or more sellers.
(d) Includes Murray Irrigation Limited (MIL) trades - the volumes and price per megalitre of MIL transactions have been adjusted to account for delivery system losses of 17 per cent on MIL entitlements prior to 1 July 2009. See MIL's website for an explanation of MIL entitlements before and after 1 July 2009.

Purchases secured under Restoring the Balance program, by entitlement type.
As at 30 September 2009

Security Level	Volume (GL)	Per cent of volume (%)	LTCE Volume (GL)	Per cent of LTCE Volume (%)
High (Vic, NSW, SA)	153.02	25	144.58	37
General security (NSW)[(a)]	372.65	61	209.81	53
Low reliability water share (Vic)	12.81	2	3.65	1
QLD supplemented	5.33	1	1.76	0
QLD unsupplemented	0.00	0	0.00	0
NSW unregulated[(b)]	28.60	5	28.60	7
NSW supplementary	39.45	6	6.49	2
Total	611.86	100	394.89	100

(a) Includes Murray Irrigation Limited (MIL) trades - the volumes and price per megalitre of MIL transactions have been adjusted to account for delivery system losses of 17 per cent on MIL entitlements prior to 1 July 2009. See MIL's website for an explanation of MIL entitlements before and after 1 July 2009..

(b) Includes the water entitlements acquired from Toorale Station

Long-term reliability factors sourced from: a - The Living Murray, 2007 Business Plan; b - 'Australian Water Entitlements', report by Webb McKeown & Associates for the Environmental Water Allocation R&D Program; and, c - Derived from CSIRO Sustainable Yields reports.

ATTACHMENT F

COMMONWEALTH ENVIRONMENTAL WATER HOLDINGS

Managing the Holdings

The Commonwealth Environmental Water Holder (CEWH) is a statutory position established under the Water Act 2007 (the Act).

The Act requires that the Commonwealth environmental water holdings be used to protect or restore the environmental assets of the Murray-Darling Basin or assets outside of the Basin where water is held for that area:

- so as to give effect to relevant international agreements; and,
- in accordance with the Murray-Darling Basin's environmental watering plan, a key element of the Basin Plan which is to be developed by the Murray-Darling Basin Authority by 2011.

Decisions on the use of environmental water in 2009-10 will be made with the aim of achieving ecological objectives for an extreme-dry period, that is, to:

- avoid critical loss of threatened species;
- avoid irretrievable damage or catastrophic events; and
- maintain key refuges to allow recolonisation when conditions improve.

Priority given to watering actions during 2009-10 will be based on an assessment against publicly available criteria. These criteria focus on:

- the ecological significance of the asset;
- the expected ecological outcomes;
- potential risks;
- the long term sustainability of the asset; and
- cost effectiveness and operational feasibility.

The assessment will also consider:

- the volume of water available from the Commonwealth's environmental water holdings;
- input from state governments and local site managers; and
- advice from an independent Environmental Water Scientific Advisory Committee.

This approach has been agreed by the Environmental Water Scientific Advisory Committee and is available on the Department's website: www.environment.gov.au/water/policy-programs/cewh.

The Environmental Water Scientific Advisory Committee comprises prominent scientists and experts in fields such as hydrology, limnology, river operations management, river and floodplain ecology and the management of aquatic ecosystems. It provides advice on:

- methods for determining relative priority of environmental assets;
- areas which merit additional investigation, including additional research; and
- assessing the benefits of the use of environmental water.

A long-term framework for the prioritisation of environmental water allocations is being prepared in consultation with delivery partners, interested stakeholders / experts and with the Environmental Water Scientific Advisory Committee (available at www.environment.gov.au/water/policy-programs/cewh).

The CEWH's business plan for 2009-10 is available at www.environment.gov.au/water/publications/action/cewh-business-plan.html.

Water Acquisition

Water entitlements purchased through the Restoring the Balance program form part of the Commonwealth environmental water holdings, which under section 105 of the Act are managed by the CEWH. While the program areas of the Department and the CEWH work closely together to ensure a consistent approach between the acquisition and management roles, the CEWH is not responsible for, nor funds the Australian Government's water acquisitions.

ATTACHMENT G

Australian Government

Department of the Environment, Water, Heritage and the Arts

A Framework for Determining Commonwealth Environmental Watering Actions

A discussion paper

Department of the Environment, Water, Heritage and the Arts

May 2009

This paper has been drafted and circulated for consultative purposes. It is done so without prejudice to future decisions on the use of environmental water or the ultimate approach to decision-making to be adopted by the Commonwealth Environmental Water Holder.

Contents

1. Introduction

The purpose of this paper is to outline a proposed framework for determining Commonwealth environmental watering actions in the Murray-Darling Basin. This framework will be developed over the period 2009-2011, prior to the development of the Environmental Watering Plan (EWP) by the Murray Darling Basin Authority, and be adapted in accordance with the EWP once that is available.

1.1. Water Reform in the Murray-Darling Basin

The *Water Act 2007* established the Commonwealth Environmental Water Holder (CEWH) as part of broader water resource management reforms within the Murray Darling Basin. These reforms are fundamentally about ensuring sustainable use of a valuable water resource. Consumptive use must be within the long-term sustainable limit so that ecosystems have sufficient water to perform key ecological functions into the future. To facilitate this outcome new arrangements are being put into place. These will ultimately be characterised by:

- a new basin-wide cap that covers both surface and groundwater extractions for consumptive use, and thereby allows flows to return to rivers and wetlands to restore the health of the system;
- a significant increase in the quantity of water entitlements that are being actively managed to provide ecologically beneficial wetting/drying and variable flow regimes;
- an Environmental Watering Plan to enable the environmental water of all holders and managers to be coordinated in a complementary basin-wide manner; and
- integration of environmental flow requirements with salinity, water quality and natural resource management arrangements.

Within this framework the CEWH has been established as a holder and manager of tradeable water entitlements, rather than as a manager of a water reserve with specific environmental characteristics or as a manager of environmental flow rules. The aim of this approach is to add a significant amount of water to the environment over and above what is currently available and with the same security of property right as consumptive users. It offers some degree of flexibility to act as a market participant and so adjust the portfolio of water entitlements as circumstances change. It is important to consider managed entitlements as one component of an integrated environmental watering approach across the Basin; an approach that will also include adaptive rules-based environmental flows in conjunction with a new sustainable basin-wide cap.

The *Water Act 2007* also establishes the Murray-Darling Basin Authority (MDBA), which must develop a plan for the management of the Basin's water resources. The Basin Plan must include an Environmental Watering Plan (EWP), which will have the objective to protect and restore rivers, wetlands and other environmental assets, and to protect biodiversity dependent on the Basin's water resources. The CEWH must manage the Commonwealth environmental water holdings in accordance with the EWP. The first EWP is expected by 2011 and to be operational in some parts of the Basin by 2014. Under Section 28(2) of the *Water Act*, the EWP must specify:

(a) the overall environmental objectives for the water-dependent ecosystems of the Murray-Darling Basin;
(b) targets by which to measure progress towards achieving the environmental objectives specified in accordance with paragraph (a);
(c) an environmental management framework for planned environmental water and held environmental water;
(d) the methods to be used to identify environmental assets in the Murray-Darling Basin that will require environmental watering;
(e) the principles to be applied, and methods to be used, to determine the priorities for applying environmental water (including applying that water to environmental assets that are identified using the methods specified under paragraph (d));
(f) the principles to be applied in environmental watering.

1.2. Making decisions on environmental watering actions

In addition to the EWP, the CEWH will require a process for making determinations on the use of available water in any given year. This process will need to be more specific than the EWP about matching water availability with water demand and should be based on a robust, scientifically defensible decision framework, in accordance with multi-year ecological and operational considerations, and flexible to changing conditions and knowledge.

A framework for determining environmental watering actions will help ensure that the Commonwealth's water is used for the best environmental outcomes that can be achieved with the volume of water that is expected to be available, and under the operational constraints that will limit options on its use. It will be based on clear ecological and management objectives and be supported by a consistent decision making process; one that allows a prioritisation of actions to occur in consideration of both immediate and longer-term needs. The Department is working to obtain important information which will input into this process, including a determination of the key environmental assets and ecosystem processes across the basin, where such information exists.

The framework described in this paper is presented as a draft for further consideration and for consultative purposes. It will be used to inform the 2009-2010 CEWH Business Plan and the approach to environmental watering for that year. It will be progressively developed over the period 2009-2011 and will help the Department provide input to the development of the Murray-Darling Basin Authority's EWP.

1.3. 2009-11 Outlook

Over the next two years a range of different scenarios that will define the context in which the Commonwealth must use its water, are possible. Depending on environmental and market conditions there will be a significant difference in the volume and type of water available to the CEWH than is currently the case.

Water in the Commonwealth environmental water holdings will be from a variety of sources and with a range of different characteristics. It will include high security and low security entitlements, regulated allocation that can be called from storage, and unregulated flow that cannot be actively managed. The exact combination of assets is not yet known but will ultimately have a significant impact on the approach to environmental watering that is possible across the Basin.

2. Overall objectives and scope of Commonwealth water use

The *Water Act 2007* prescribes that within the Basin, Commonwealth water must be managed for the purpose of protecting or restoring the environmental assets of the Basin, so as to give effect to relevant international agreements. Relevant international agreements include the Ramsar, Bonn, Desertification, Biodiversity and Climate Change Conventions, and Migratory Birds agreements with Japan, China and the Republic of Korea.

These agreements cover a broad range of issues. For example, the Biodiversity Convention requires Parties to rehabilitate and restore degraded ecosystems, and adopt measures for the recovery and rehabilitation of threatened species. It also promotes the protection of ecosystems, natural habitats and maintenance of viable populations of species in natural surroundings.

The Ramsar Convention aims to have listed wetlands (Ramsar sites) managed in a manner that preserves their ecological character. It also includes a more general objective of promoting the wise use of all wetlands. A broad range of environmental watering actions could therefore usefully give effect to these sorts of outcomes.

The *Water Act 2007* defines environmental assets as water-dependent ecosystems, ecosystem services, and sites of ecological significance. Water-dependent ecosystems include wetlands, streams, floodplains, lakes and other bodies of water, salt marshes, estuaries, karst, and groundwater systems.

In protecting or restoring these assets, we are seeking to contribute to the sustainable use of the Basin's water resources. Defining a sustainable water resource from an environmental perspective is not without its challenges and the Basin Plan is expected to provide guidance on this. In the meantime the Department will be seeking to describe the characteristics that define a sustainable basin-wide system in order to provide a framework under which the Commonwealth can prioritise, and explain on a scientific basis, our watering actions. Determining the optimum levels and ecological equilibrium points will be limited, in some cases seriously so, by available scientific knowledge. In many cases these may never actually be known with certainty. Learning to operate with scientific uncertainty in an appropriate risk management framework will be a central component of Commonwealth environmental watering.

A sustainable basin-wide system is one which is able to provide a long-term balance between maintaining the ecological resilience of its water-dependent ecosystems and continuing to meet human needs. It is about recognising that as a system it exists not as a series of independent, albeit high value sites or river reaches, but rather as a network of interdependent life supporting connections and processes, and that watering needs and opportunities vary significantly at different times and in different parts of the basin.

Although it does recognise that some sites or river reaches may contribute disproportionately to overall system health through the richness of their biodiversity or the strength of their ecosystem processes, maintaining the health of such sites is also about supporting their dependent processes and the health of related sites and river reaches; assets which may when considered in isolation, be seen to be of lesser value.

The Basin's rivers and streams typically exhibit high variability of flow. This variability is essential for maintaining the health and function of its ecosystems. The dependent flora and fauna have adapted to, and are often dependent on, the highly variable flows which result from the region's variable and unpredictable climate. Population booms accompany floods, with floodwaters triggering breeding events and seed germination. As floodwaters recede and drier conditions prevail, many species die, leaving their eggs or seeds for the next flood, while others will become dormant or migrate. Some mobile species retreat to permanent waterholes which provide refuges when other parts of the floodplain dry out.

The expanding and contracting floodwaters also provide important ecosystem connectivity between the main river channel and the floodplains. The floodwaters supply the floodplains with nutrients and sediments from the river, accelerate the breakdown of organic matter and replenish and refill disconnected floodplain water bodies, in addition to stimulating animal and plant life. As the waters recede, the floodplains provide the main river channel with organic matter (which is decomposed to produce carbon) as well as living organisms. The floodplains also rid the water of excess nutrients, in effect, reducing the risk of blue-green algal blooms.

In this context and from the perspective of setting the parameters under which environmental water should be provided to the Basin, a sustainable basin-wide system exhibits the following characteristics:

- Ecological processes functioning across the basin are as close as possible to natural given the constraints extant in each catchment (i.e. other water users, climate change, existing land-use, etc).
    - Energy and nutrient exchange processes between the rivers and floodplains are as close as possible to natural given the environmental conditions that persist in each catchment;
    - Sediment transport processes are as close as possible to natural given the environmental conditions that persist in each catchment;
    - As much as possible of the natural diversity of water-dependent habitats exists in any given river reach or catchment;
    - Physical and chemical water properties across the basin are as close as possible to natural for the ecosystems that prevail in each catchment;
    - Soil formation, primary production and other metabolic processes are as close as possible to natural given the environmental conditions that persist in each catchment.
- Water-dependent ecosystems support diverse communities and are resilient across the Basin.
    - Distribution and abundance of species within a given ecosystem are at or approaching their potential carrying capacity given prevailing environmental conditions;
    - Ecological communities contain available and healthy refuge sites when drier conditions prevail;
    - Native species have access to suitable habitat at each stage of their life-cycle and recruitment levels are sustained;
    - Connectivity pathways between water-dependent ecosystems occur at optimum frequencies and durations given prevailing environmental conditions.
- There is a diversity of functional and resilient water-dependent ecosystem types across the Basin.
- Society's awareness and understanding of how the Basin functions as an ecological system is constantly improving and constraints to a healthy ecological system are continually identified and addressed.

In practice these overall parameters for a sustainable basin-wide system will define the scope under which the Commonwealth will use its water. For the CEWH's environmental watering decisions it will mean:

- Water is provided to aquatic ecosystems in consideration of natural variability, seasonality (and other temporal patterns), flow velocity and volumes;
- Prioritisation of environmental watering actions must consider the ecological opportunity costs of otherwise using that water at a basin-wide scale;
- Providing water to critical connecting processes that support ecosystem health is in many cases as important as providing water to high-value sites themselves;
- Prioritisation of environmental watering must consider using water for multiple benefits and multiple uses wherever possible;
- In using water for any particular objective, how that water is made available, the impediments to delivery including transmission losses, cost effective use and wider ecological impacts, are considered from a systems perspective;
- Water is used for a diversity of ecological outcomes throughout the Basin;
- Measures are put in place to ensure that learning from environmental watering takes place and that impediments to desired ecological outcomes are identified and addressed.

It is important to note that the Commonwealth's use of water will be only one of a number of initiatives aimed at achieving a sustainable basin-wide system. The reforms of the National Water Initiative, the establishment of the MDBA, the Basin plan, a basin-wide sustainable diversion limit, water-sharing plans, land-use practices, and natural resource management activities amongst other components, will all play a crucial part and in many cases also impact upon the effectiveness of the use of environmental water.

Question 1: Does the scope of Commonwealth environmental watering as outlined, meet your expectations of the range of ecological parameters that should be considered in the use of Commonwealth environmental water?

3. Specific water use objectives

In the current extreme dry period the management objectives agreed by the Living Murray's environmental watering group and used by the CEWH in 2008-09 are:

- to avoid critical loss of threatened species;
- to avoid irretrievable damage or catastrophic events; and
- to maintain key refuges to allow recolonisation when conditions improve.

Different management objectives will be required under different conditions. In the coming spring (2009) it is likely that the Commonwealth will have substantially more water available to achieve environmental objectives. As noted above this means that a range of opportunities that are not currently available to the CEWH will become so.

In addition to the ecological objectives under extreme dry conditions, table one presents a proposed set of objectives for conditions in: a dry year; a year close to the long-term median; and a wet year, that is, greater than median rainfall and runoff. It is important to bear in mind that shifts in climate, such as the apparent shift to a drier regime in the last ten years, will have a significant impact on what is possible and an historical assessment of rainfall and runoff will also need to consider the conditions relative to more recent history.

Table 1: Proposed ecological watering objectives under different water resource availability scenarios

	Extreme Dry	Dry	Median	Wet
Ecological watering objectives	Avoid damage to key environmental assets	Ensure ecological capacity for recovery	Maintain ecological health and resilience	Improve and extend healthy and resilient aquatic ecosystems
Management objectives	- Avoid critical loss of threatened species and communities - Maintain key refuges - Avoid irretrievable damage or catastrophic events	- Support the survival and growth of threatened species and communities including limited small-scale recruitment - Maintain diverse habitats - Maintain low flow river and floodplain functional processes in sites and reaches of priority assets	- 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 functional processes	- Enable growth, reproduction and large-scale recruitment for a diverse range of flora and fauna - Promote higher floodplain-river connectivity - Support high flow river and floodplain functional processes
Management actions	- Water refugia and sites supporting threatened species and communities - Undertake emergency watering at specific sites of priority assets - Use carryover volumes to maintain critical needs	- Water refugia and sites supporting threatened species and communities - Provide low flow and freshes in sites and reaches of priority assets - Use carryover volumes to maintain follow-up watering	- Prolong flood/high-flow duration at key sites and reaches of priority assets - Contribute to the full-range of in-channel flows - Use carryover to provide optimal seasonal flow patterns in subsequent years	- Increase flood/high-flow duration and extent across priority assets - Contribute to the full range of flows incl. over-bank - Use carryover to provide optimal seasonal flow patterns in subsequent years
	Damage avoidance →	Capacity for recovery →	Maintained health and resilience →	Improved health and resilience

The objectives in Table 1 seek to provide guidance as to how water should be used under different climatic and flow conditions. These conditions will impact upon how much water is available in the system, including how much is available to the Commonwealth. Subject to system constraints, in some cases water would be used in conjunction with natural flows and in some cases with water made available by delivery partners. The system as a whole would be more reflective of the prevailing climatic conditions, which would

not only be impacting on the volume of held environmental water, but on the total volume of water flowing through the system.

As conditions progress from extreme dry through to wet and more environmental water becomes available, the ecological objectives in Table 1 progress from damage avoidance to maintenance of refugia and the capacity for recovery, to maintaining health and resilience, to an expansion of healthy ecosystem. Longitudinal and lateral connectivity are progressively provided to a greater range of habitats as channel flows and flood volumes and frequencies increase, so that a greater range of watering options becomes possible.

In progressively wetter conditions a more holistic, systems approach becomes more feasible. However, it is important that such an approach be considered in all scenarios. For example, under dry conditions a systems approach might involve using water at sites spread broadly across the Basin to ensure the capacity for broad system-wide recovery. Water for refugia would be provided in consideration of the number of other refuge sites in the vicinity and across the Basin for the relevant species or ecological community.

Under **dry** conditions, where allocations are below the median, the objective is to maintain refugia, supporting the survival and growth of threatened communities to ensure a capacity for recovery when wetter conditions return. In-channel flows and wetland regimes would be focused on the lower end of the hydrograph. Watering actions would be spread across the Basin to help ensure capacity for system-wide recovery, and recovery in as many ecosystem types as possible. Some limited small-scale recruitment could be supported.

Under **median** conditions, the ecological health and resilience of the system should be maintained by supporting not only survival and growth, but also reproduction and small-scale recruitment. Flows would be focused in-channel but on higher, less frequent flows delivered at the optimum time of year. Some limited river-floodplain connectivity and flooding may be desirable for low-lying floodplain areas at the highest priority assets.

Under **wet** conditions, larger natural flow volumes should enable the CEWH to contribute to an expansion of the area of healthy ecosystem across the Basin and to larger-scale recruitment. This would be achieved by increasing the frequency, volume, duration and floodplain extent of flooding events. Contributing to the full-range of natural flow variability should become possible, in particular flows at the upper end of the hydrograph, including bank-full and perhaps some limited over-bank flows for more sites than just the highest priority ones. River-floodplain connectivity would be provided to higher-lying areas than is possible under drier conditions.

As a larger volume of water is available to be managed in wetter conditions it becomes appropriate to make greater use of carryover options to ensure that water can be used at the optimum time of year. This approach could, for example, be used to enable winter/spring flows to be allowed to pass through 'translucent' storages to the river downstream.

The actual approach that is implemented will need to be determined on a catchment-by-catchment basis and in some cases on a sub-catchment basis, subject not only to the water resource outlook but also to the individual requirements of the environmental assets located there. The biogeographic, topographic, resource use, and climatic context, as well as the volume of water that can actually be delivered, will all need to be considered. The provision of environmental water will also need to be made in consideration of previous watering decisions, flow history and follow-up water requirements at each environmental asset.

Question 2: Do you agree with the proposed ecological objectives under different water availability scenarios outlined in the table above, or can you offer suggestions for improvement?

4. Prioritisation process

The key component of a framework for determining environmental watering actions is the decision making process upon which a prioritisation of actions and the matching of priorities with available water occurs. In 2008-09, a set of nine criteria was used to prioritise watering actions (Attachment A). As more water becomes available and climatic conditions change these criteria will need to be enhanced, including with the development of associated decision support tools. It is expected that several iterations will be required over the course of the *Water for the Future* initiative, particularly once the Basin Environmental Watering Plan has been developed.

A robust decision framework that matches available water to the highest priority requirements given prevailing conditions and within the parameters set by the watering objectives should be capable of considering multi-year ecological needs and be flexible to changing circumstances. Multi-year considerations include stochastic hydrological variability, wetland wetting-drying cycles, breeding/recruitment cycles, the need for follow-up flows, the condition of the asset, and complementary works and natural resource management arrangements which may help to maximise outcomes.

The diagram below (Figure 1) seeks to illustrate how a decision framework may arrive at an appropriate matching of available water with priority watering actions. It incorporates the elements of the nine criteria used for prioritising watering actions in 2008-09 and would be governed by the overall objectives, and the practical application of those, outlined above.

The process starts from two points. To the left, is an *environmental asset register*, which would contain a prioritised list of all environmental assets that could potentially be targeted by Commonwealth water. The environmental asset register would exist as a database of all possible watering options in each catchment of the Basin as guided by the definition of environmental assets set out in the Water Act. It would encompass watering options at various spatial scales from individual refuge sites and wetlands, through to series of wetlands, to individual river reaches and to entire rivers, depending on what is in-scope, given overall water availability.

The asset register would need to be established in consideration of the Commonwealth's legislative obligations and the international agreements referred to in the Water Act. Each environmental asset would have one or more ecological values/attributes which would inform the specific ecological objectives for watering actions and establish the basis for determining their ecological significance. The register would contain information necessary to establish the multi-year watering requirements of the ecological values of each asset, so that planning can consider the longer-term requirements of specific assets.

To the right, are the Commonwealth's water holdings. Arriving at an alignment between the priority environmental assets and the water holdings is the purpose of the framework and it consists of four main steps. A brief description of each follows:

1. *Forecast total water availability*. In determining how much water is available for use it is important to understand the characteristics of that water. In particular where it is located and where it can be delivered given any constraints (e.g. channel capacity; transmission losses; trading limitations; other water users), and whether or not it can be controlled or used in combination with different types of environmental water. The timing of water availability is also an important consideration. Earlier in the season, less water allocations will have been made by the water authorities and so fewer watering options will be open to the Commonwealth. This constraint can be offset to some extent by carryover water (subject to different conditions in different parts of the basin) but not eliminated entirely and will be a limiting factor to consider.

   The forecast water availability should also include consideration of the projected water availability of delivery partners as cooperative watering will be key to achieving the overall objectives.

2. *Determine the watering options in-scope at each asset*. To ensure a system-wide approach to environmental watering, at the start of the watering year it will be important that there is understanding of all the options in-scope across the Basin. This will depend on an assessment of current water needs at each priority asset and the forecast of total water availability. Current water needs will vary seasonally and will be determined based on the known optimum flow requirements and recent flow history at each asset, as well as the conceptual models which identify the ecological responses that can be expected. These conceptual models will present the scientific hypotheses linking water regimes to ecological outcomes. They are critical to setting objectives and to understanding and monitoring expected responses.

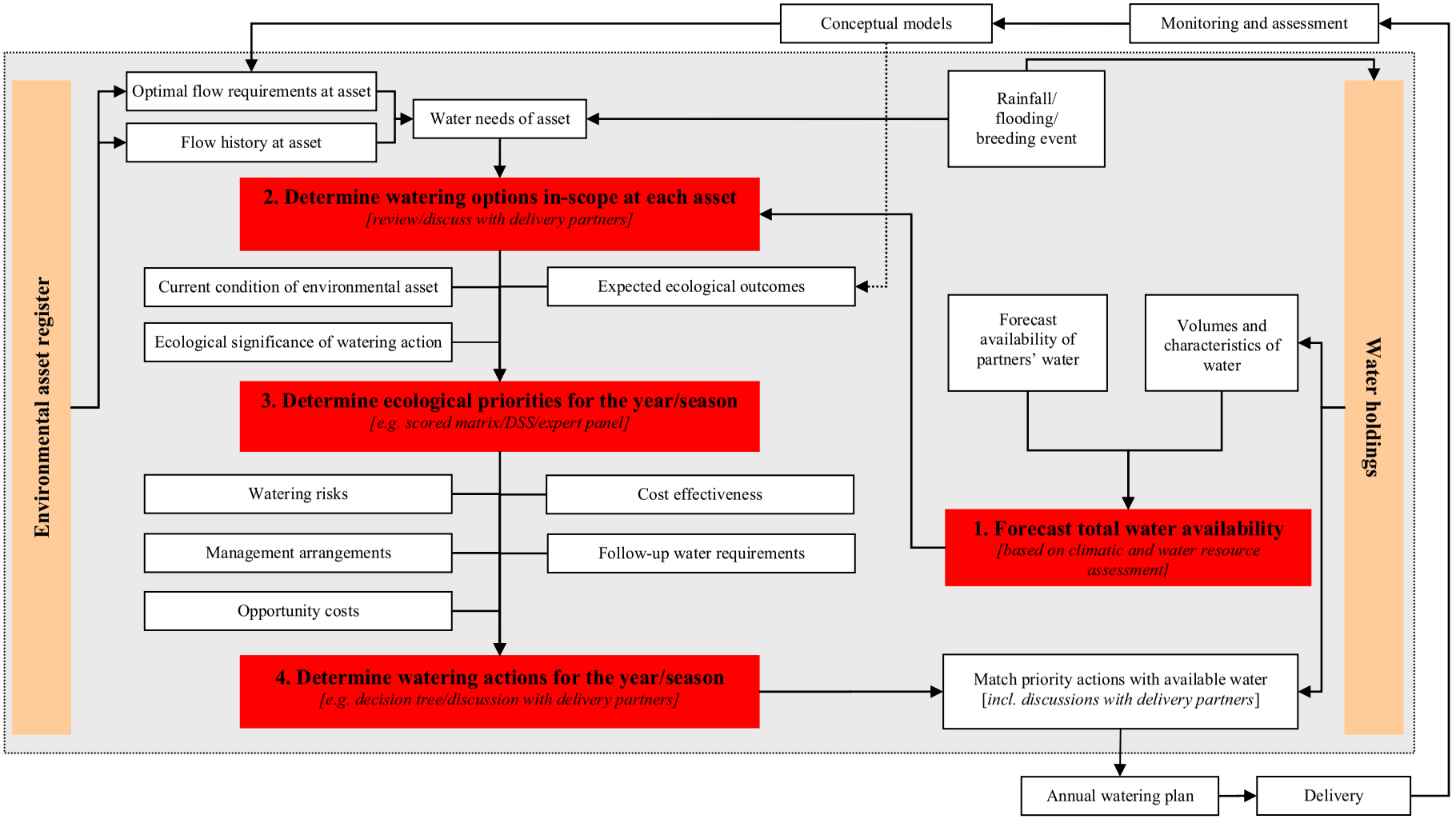
3. *Determine ecological priorities for the year.* Once all the options that are in-scope have been identified, a prioritisation based on the ecological significance of each location, its ecological functions in the basin-wide context and the nature of the biodiversity affected, can be undertaken. This might be done initially by use of a rating scale based on, for example, the criteria of criticalness, distinctiveness, representativeness, diversity, the magnitude and expected benefit from the watering action, the current condition of the asset, and the history of watering and the urgency of its water requirements. Ultimately it might involve a more sophisticated Bayesian model or similar tool, or possibly the use of an expert panel.

   The criticalness, distinctiveness, representativeness and diversity of assets are criteria developed as part of the national policy framework for the identification, classification and management of High Conservation Value Aquatic Ecosystems (HCVAE). There may be value in using similar criteria to determine ecological significance given that many listed HCVAE are likely to be high priorities for environmental water.

   In any consideration of its ecological priorities the Commonwealth will need to ensure it is meeting its legislative responsibilities, particularly those that contribute to fulfilment of international obligations. These obligations include promoting the conservation of Ramsar listed wetlands, rehabilitating or restoring degraded ecosystems, promoting the recovery of threatened species, and protecting the habitat of certain migratory birds.

   An assessment of ecological priorities should also consider the current condition of the asset and the likelihood of achieving the objective of watering, whether that involves restoring a degraded site or river reach, or maintaining an already healthy site or river.

Figure 1: Commonwealth prioritisation framework for matching environmental water with environmental assets



4. *Determine watering actions for the year*. The priority list of ecological objectives will then need to be assessed based on a number of criteria to determine the feasibility and most effective use of the available water. This process would be expected to involve the use of a decision tree with threshold tests and discussions with delivery partners and on-ground environmental managers. These criteria would include:

    a. *Watering risks*. The possible threats that may result from a watering action. These might include threats such as salinity and other water quality issues, flood damage, acid-sulfate soils, and invasive species amongst others. Any assessment will need to be based on a comprehensive risk management framework and consider the mitigation and contingency plans of site managers and delivery partners;

    b. *Management arrangements*. An assessment of arrangements (both for watering and for broader natural resource management) that are in place is critical to ensuring that water is used where it will be most effective. Management arrangements include those to mitigate any risks identified in the previous step, the adequacy of delivery and monitoring arrangements, ongoing site management, the presence of complementary natural resource management activities, and a commitment to adaptive learning;

    c. *Cost effectiveness.* An assessment of cost effectiveness would be based on the amount of Commonwealth water and resources needed to enable delivery; other factors affecting the watering, such as transmission losses; opportunity to leverage off other water releases (e.g. ability to use environmental water with stock and domestic releases) and to realise multiple use/benefits;

    d. *Follow-up water requirements*. An assessment of the need for follow-up water is important for determining whether or not a particular watering action is a feasible option in the longer-term; and

    e. *Opportunity costs*. The process as outlined would enable a prioritised list of watering actions. However, such a list is based on comparing one watering action with other actions on an individual basis. It is important to compare options not just as one event versus another but as one event versus all others that could otherwise be achieved with the same volume of water. An assessment of the basin-wide opportunity cost of using water for any one option therefore needs to be undertaken. This would include an assessment of the opportunity cost of carrying over the water to the following year.

In developing a priority list of watering actions it is important that it is flexible enough to consider changing circumstances and the opportunities that those changes provide. For instance an unexpected flooding event might push one particular priority action higher on the list and make others redundant. As a result the framework will require the capacity to take into account a range of contingencies. Trigger points and cut-off dates will need to be established for options associated with natural flows.

Question 3: Do you have a view on how the four main steps outlined above should be further developed?

The tools that enable this framework to be implemented, including the means to prioritise based on ecological significance, require further development. In the meantime decisions will be based on a qualitative review undertaken using the information sources outlined in table two.

Table 2: Basis for determination, possible criteria and current information sources for each decision step

Step 1	Basis for determination	Information sources
What is the forecast water availability? [*Volume by catchment*]	- water entitlement availability, characteristics and deliverability	- water holdings register - trading rules - known channel capacity and river operations restrictions
	- long-range water resource forecasts/ seasonal outlook	- Bureau of Meteorology forecasts
	- historical allocations	- historical allocation data
	- volumes available to delivery partners	- advice of delivery partners and water authorities

Step 2	Basis for determination	Possible Criteria	Information sources
Is the watering option in scope? [*Yes/No*]	- projected water availability (incl. ability to deliver)	- ability to deliver sufficient water to the environmental asset to meet ecological objectives	- from step one - on ground expertise (e.g. CMAs & water authorities) - MDBA modelling on water deliverability and multiple use
	- need for water	- optimal water requirements to achieve ecological objectives at the asset	- studies undertaken on flow requirements - on ground expertise (e.g. CMAs) - conceptual models - EWSAC advice
		- flow history at the asset	- MDBA and water authority flow gauge data - watering history reports
		- likelihood of natural flow/event trigger points	- hydrological history - MDBA and water authority flow gauge data
		- consistency with ecological and management objectives at the asset	- site management plans - Commonwealth environmental watering policy / objectives

Step 3	Basis for determination	Possible Criteria	Information sources
What is the ecological priority of the watering action? [*High/medium/low*]	- ecological significance of the watering action	- diversity of habitat, species and communities to benefit from the watering action	- *EPBC Act* database - DEWHA wetlands database - HCVAE list and supporting documentation - site description reports - EWSAC
		- criticalness of habitat or ecological process to be watered, in terms of: conservation status of species and communities, refuge and recruitment needs	- *EPBC Act* database - DEWHA wetlands database - HCVAE list and supporting documentation - site description reports - EWSAC
		- distinctiveness of habitat or species and communities to benefit from watering action	- *EPBC Act* database - DEWHA wetlands database - HCVAE list and supporting documentation - site description reports - EWSAC
		- representativeness of habitat or species and communities to benefit from watering action	- *EPBC Act* database - DEWHA wetlands database - HCVAE list and supporting documentation - site description reports - EWSAC
		- contribution to broader ecological processes/ ecosystem services	- conceptual models based on scientific studies - EWSAC
	- expected ecological outcome of the watering action	- magnitude and importance of the expected ecological response (area watered, recruitment magnitude, connectivity provided) and the likelihood of success	- conceptual models - site management plans - on-ground expertise - EWSAC
	- current condition of the asset	- overall health of asset and degree of degradation - nearness to known critical watering thresholds and long-term sustainability	- on ground expertise - MDBA and water authority flow gauge data - watering history reports - site condition reports

Step 4	Basis for determination	Possible Criteria	Information sources
Is the watering action a priority? [*Ordered list*]	- ecological priority	- high/medium/low priority	- from step 3
	- negative risks	- likelihood and consequences of negative outcomes from watering	- site management plans - on ground expertise
	- management arrangements	- consistency with site management plans	- site management plans
		- presence of complementary NRM activities	- NRM reports and planning documents – CMAs
		- adequacy of monitoring and assessment arrangements	- monitoring and assessment plans of delivery partners
	- cost effectiveness	- magnitude of transmission losses	- MDBA transmission loss data
		- magnitude of delivery costs	- discussions with delivery partners
		- ability for multiple use and opportunity to leverage off other water	- MDBA modelling on water deliverability and multiple use
		- presence of plans to reduce delivery costs in future	- works and measures plans
	- Follow-up requirements	- likely ability to be able to provide follow-up water, as required	- advice of delivery partners - watering history reports - conceptual models
	- Opportunity costs	- basin-wide trade-offs (including multi-year) for the watering action	- volume of water require - other priority actions and their water requirements

Question 4: Do you have a view on the adequacy of the 'basis for determination', 'possible criteria' and 'information sources' for each step as outlined in the above table?

4.1 The scientific basis for determining environmental watering actions

The Commonwealth is committed to a science-based approach to the prioritisation process. It will work with the Department's Environmental Water Scientific Advisory Committee (EWSAC) to establish methods for determining relative priorities for environmental watering within the context of this framework. It is expected that two components in particular will be the initial focus of this work: i) the conceptual models on which watering decisions are based; and ii) the methods for ranking different watering options based on their ecological significance.

4.1.1 Conceptual models

The proposed framework for determining environmental watering actions relies on the establishment of conceptual models which will describe the relationships between components of the flow regime and ecological outcomes that underpin the objectives being sought. For instance, the expected response from a community of macrophytes resulting from wetland inundation of a certain depth; or the expected response from a target community of riparian vegetation from an over-bank flow.

Given the complexities and uncertainties involved, it will be necessary to start with some relationships at a first principles level based on the advice of on-ground environmental managers and the EWSAC. For example, a medium spring flow in a certain river reach creates conditions suitable for native fish breeding; or, a bank-full flow creates conditions for habitat formation suitable for invertebrates, native fish, and aquatic plants. Models might initially focus only on fish, vegetation, and waterbirds. Of course conditions vary from one river reach to the next but in the initial stages it is unlikely that sufficient information will exist to take account of all variables across all potential watering sites. As we progress, more complex models involving probabilities and higher order outcomes could be considered.

4.1.2 Ecological priorities

Once the ecological objectives that are in scope have been established there is a need to prioritise the watering actions that will achieve the objectives in order to align available water with the highest priority needs. In the first instance a determination of the significance of the ecological function being assessed will need to be undertaken. In other words on what basis, from a scientific perspective, can we determine whether to put water towards ecological objective A versus ecological objective B? The prioritisation process is likely to need to consider the significance of the biodiversity and ecological functions affected by

the watering actions and the values of the asset itself based on a standard set of criteria such as those indicated in table two above.

4.2 Information requirements

The scope of a decision framework as described will ultimately require a significant amount of information and data. This will progressively be available at varying levels of detail and quality and include:

- identification of the priority environmental assets across the basin, including their specific ecological values and where possible the linkages between them;
- the range of ecological processes that impact upon the condition of each ecological asset in relation to flow regime at different temporal and spatial scales;
- the optimum watering regimes, including variability and seasonality, required to support specific ecological values and dependent processes;
- the hydrological history (both natural and e-watering) of each asset;
- hydrological models for considering likely flow outcomes from watering events at individual sites/reaches;
- the conceptual models upon which ecological objectives can be based;
- an understanding of the likely impacts of climate change on water availability with respect to each environmental asset; and
- the capacity to deliver Commonwealth environmental water to environmental assets across the basin.

Further work is required to synthesise available information including from sources such as the National Water Commission (e.g. Ecological outcomes of flow regimes study – for conceptual models), the CSIRO (e.g. Sustainable yields study – for hydrological data incl. climate change impacts), the MDBA (e.g. Sustainable Rivers Audit), and Land and Water Australia (e.g. Ecohydrological regionalisation of Australia – for flow regime classes and related landscape characteristics across the basin). Relevant information is also likely to be incorporated from the Victorian FLOWS methodology used in the Victorian Environmental Flows Monitoring and Assessment Program (VEFMAP), and the hypotheses used in New South Wales' Integrated Monitoring of Environmental Flows (IMEF) program.

In developing the framework it is likely that tools such as the Murray Flows Assessment Tool (MFAT), the eWater CRC's River Manager and Ecological Modeller, and the Ecological Limits of Hydrologic Alteration (ELOHA) framework, could be drawn upon to generate some inputs to a decision support tool.

A review and synthesis of all these studies/tools/frameworks will need to be undertaken to determine which elements can most usefully inform the development of the framework and also be consistent with the development of the Basin environmental watering plan.

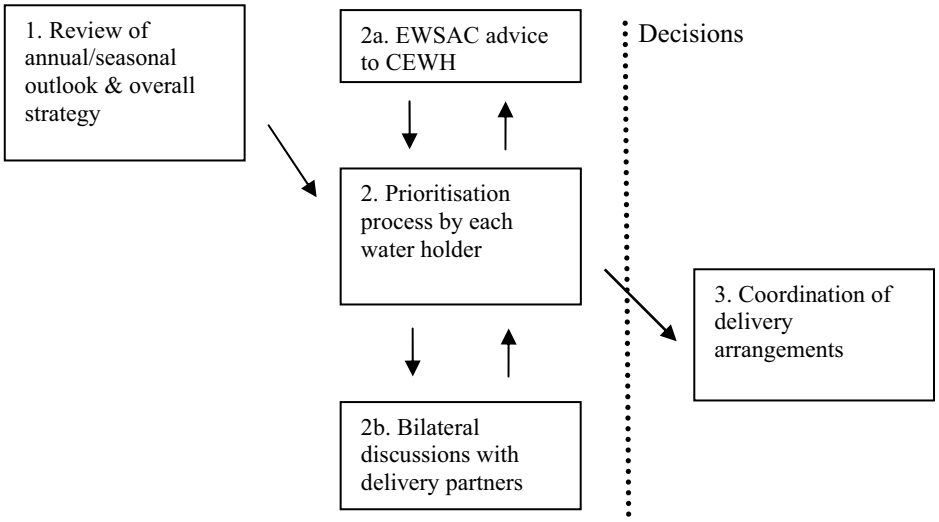
Question 5: Do you have a view as to how the various studies/tools/frameworks mentioned should be used to develop the Commonwealth's framework for prioritising watering actions?

5. Cooperative environmental water use

A central element of the proposed Commonwealth approach to environmental water use involves cooperative watering with other environmental water holders and managers throughout the Basin. As described in the *Water Act*, it is expected that the MDBA will coordinate this cooperative water use in accordance with the EWP once that comes into effect.

There are likely to be three key steps for determining environmental watering actions in a cooperative process. These are outlined in figure 2 below: i) scoping and consultation phase involving a strategic overview; ii) prioritisation phase; and iii) delivery coordination phase.

Figure 2: Proposed process for cooperative environmental watering



Step 1: Scoping and consultation phase – strategic overview

This step would clarify the amount of water expected to be available for environmental watering across the Basin. It would set out and refine the ecological aims and objectives for each delivery partners' watering program and scope possible watering options across the Basin in light of these parameters.

The purpose of this step would be for all water holders and managers to obtain a strategic overview of watering options across the Basin given the expected volumes of all environmental water for the next year and the specific ecological requirements for the next season. It would involve both a seasonal outlook and a strategic discussion based on that outlook and would consider the multi-year requirements of priority environmental assets.

Based on the seasonal outlook for all environmental water across the Basin, all water holders and managers would need to outline the range of watering options they would be able to consider in the coming year and season. The range of options would need to be developed in consideration of:

- the volumes of all environmental water likely to be available (all sources, not just Commonwealth water);
- expected outcomes, risks and contingency allowances for each option;
- multiple-use scenarios across jurisdictions;
- trigger points and cut-off dates associated with natural events;
- basin-wide strategies for specific species/communities (e.g. hardyhead); and
- constraints to water delivery (e.g. trading rules; channel capacity).

The outcome of this step would be a common understanding of the volume and types of water available for cooperative watering across the Basin and the range of options open to each environmental water holder and manager. Each delivery partner would then be in better position to identify priority watering actions that are consistent with overall objectives and priorities from a basin-wide perspective. Ultimately it is expected that this phase would be guided by the MDBA's Environmental Watering Plan.

Step 2: Prioritisation phase

The purpose of this step would be to provide each watering partner with the opportunity to prioritise specific actions based on the volume that they expect to have available to them through their own water entitlements. It would involve each partner determining priorities in the context of the overall ecological goals and the scope of watering options outlined under Step One.

Information requirements would be met by the *environmental asset register*. The register would include information on priority assets and their watering needs and would be stored in a central, spatially–defined database.

Although each delivery partner would prioritise actions with respect to their own volume of water, it will be necessary to work collaboratively to take advantage of efficiency savings and the more effective outcomes that could be achieved by pooling water together. The Commonwealth's prioritisation of options would be undertaken using the framework as described above, and in consultation with the EWSAC.

The outcome of this step would be a consolidated basin-wide list of priority actions to be undertaken by each watering partner. Some of these actions may include trigger points for use associated with natural flows and cut-off dates if those flows did not eventuate.

Step 3: Delivery phase

The purpose of this step would be to ensure complementary and cost-effective use of water. Discussions would occur on the nature and location of use and the opportunity for multiple uses. These discussions would need to ensure that water from a variety of sources can be provided in appropriate volumes to achieve the agreed ecological objectives and that sufficient contingency water is available across the Basin for follow-up watering. The outcome of this step would be that water is provided in appropriate volumes to meet agreed objectives and to manage risks.

As the outcome of step two would be an agreed contribution of each partner to watering actions, many of which may be subject to specific conditions (e.g. natural flow events), it will be important to coordinate closely with all partners, including The Living Murray (TLM) program, when triggers and cut-off points eventuate. Ultimately it is expected this phase will be guided by the schedules of the Environmental Watering Plan.

Question 6: Do you have a view on how the process for cooperative environmental watering as described could be improved?

6. Prioritising environmental watering actions in 2009-10

In 2009-10 the Commonwealth will use a similar set of criteria for prioritising watering actions as used in 2008-09 and which are incorporated into the framework as described above. This will be adapted to consider larger volumes of water and possibly different water resource scenarios as described earlier in this paper. With larger volumes available it will be necessary to consider multi-year objectives and carryover needs subject to whether water resource availability is characterised as extreme dry, dry, median or wet.

The Commonwealth expects to be able to consider a greater range of environmental assets for water delivery as a result of the availability of further information, ongoing engagement with our delivery partners, and larger volumes of Commonwealth water throughout the Basin, including a significant volume in unregulated rivers.

Question 7: Do you have any suggestions on improving the criteria for short-listing watering priorities at Attachment A, for use in 2009-10?

Comments and suggestions can be provided to:

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Environmental Water Policy Section
Water Governance Division
Department of the Environment, Water, Heritage and the Arts

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Attachment A

Criteria for short listing watering priorities in 2008-09

1. Must meet the requirements of section 105 of the *Water Act 2007* and the approach articulated in section 3.2 of the Business Plan.

2. The ecological significance of the asset (includes matters such as Ramsar or DIWA listing, presence of nationally listed threatened, migratory or rare species).

3. The expected ecological outcomes from the proposed water use, based on:
    a. the current health of assets, antecedent conditions, and the likely response to watering (based on previous experience or expert opinion);
    b. other factors which may affect ecological health; and
    c. the existence of a site management plan.

4. Any potential risks resulting from the proposed watering action, including the likelihood and significance of:
    a. negative outcomes from the watering action and measures taken to minimise these;
    b. negative outcomes of *not* undertaking the watering action this year (i.e. related to the urgency of the need); and
    c. not achieving the expected ecological outcomes.

5. The degree to which Commonwealth water is likely to make a substantial contribution to protecting or restoring the ecological significance of the asset.

6. The contribution of the delivery partner to the watering event (e.g. water volume, financial, monitoring, management).

7. The cost effectiveness of undertaking the watering, based on:
    a. the amount of Commonwealth water and resources needed relative to the contribution of the State and delivery partner to the watering event;
    b. other factors affecting the watering, such as transmission losses;
    c. opportunity to leverage off other water releases (e.g. ability to use environmental water in concert with stock and domestic releases) and to realise multiple benefits.

8. The long-term likelihood of sustaining the ecological values of the asset (including information on the general inundation frequency of the area, i.e. whether the asset will survive with natural watering plus occasional supplementary environmental watering, or whether it be totally reliant on environmental watering for survival).

9. The adequacy of the governance and management arrangements, including the monitoring and evaluation activities, in place to ensure effective outcomes from the watering action.