Australian Government

Commonwealth Environmental Water Office

Integrated planning for the use, carryover and trade of Commonwealth environmental water

Planning Approach

2015–16

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Acknowledgement of the traditional owners of the Murray-Darling Basin

The Commonwealth Environmental Water Office respectfully acknowledges the traditional owners, their Elders past and present, their Nations of the Murray-Darling Basin, and their cultural, social, environmental, spiritual and economic connection to their lands and waters.

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This report should be attributed as 'Integrated planning for the use, carryover and trade of Commonwealth environmental water: Planning Approach 2015–16, Commonwealth of Australia 2015'.

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Contents

1. Introduction

1.1. Roles and responsibilities of the Commonwealth Environmental Water Holder

The Commonwealth Environmental Water Holder (CEWH) is an independent statutory position established by the *Water Act 2007* (the Water Act) to manage the Commonwealth environmental water holdings. The Commonwealth Environmental Water Holder leads and is supported by the Commonwealth Environmental Water Office (the Office), a division of the Australian Government Department of the Environment.

Under the Water Act, Commonwealth environmental water must be managed to protect or restore environmental assets, so as to give effect to relevant international agreements. The broadness of these international agreements means there are a wide range of actions that would give effect to them. The main requirement is that Commonwealth environmental water management is for the primary purpose of achieving environmental outcomes.

The Water Act requires that the Commonwealth Environmental Water Holder perform its functions and exercise its powers consistently with and in a manner that gives effect to the Basin Plan and that Commonwealth environmental water is managed in accordance with the Basin Plan's environmental watering plan.

The Water Act limits the selling (disposal) of Commonwealth environmental water to circumstances where:

- the water is not required in the current water year to meet the environmental objectives of the environmental watering plan and cannot be carried over to the next water year; or
- the proceeds of selling the water improve the capacity of the holdings to meet the environmental objectives.

The Commonwealth Environmental Water Holder must also comply with the specific requirements and standards of Commonwealth legal, policy and environmental frameworks, including the *Public Governance, Performance and Accountability Act 2013*, the *Public Service Act 1999* and the *Environment Protection and Biodiversity Conservation Act 1999*.

1.2. Approach to managing Commonwealth environmental water

The Commonwealth Environmental Water Holder is committed to being a 'good neighbour' and has adopted the following approach to managing environmental water:

- **Maximising the environmental outcomes**: The Commonwealth environmental water portfolio is used to achieve the best environmental effect, through water delivery, carry over and trade.
- **No intended harm**: A conservative risk based approach to environmental flow management is taken so that unintended impacts do not occur. All decisions on water use are informed by a comprehensive assessment of risk, with arrangements put in place to ensure risks are appropriately managed. Commonwealth environmental water is also ordered and delivered at flow rates generally below the operational limits to provide a buffer against unpredictable local inflows resulting from rainfall.
- **Using local knowledge:** We are committed to working closely with communities and delivery partners (including state agencies, river operators and local advisory groups) so they can engage meaningfully on Commonwealth environmental water management.

This engagement is critical to ensure water is delivered to important environmental assets and potential impacts and risks are identified and managed.

- **Negotiating consent:** If potentially unacceptable impacts on private property are identified we will negotiate with affected landholders to avoid or minimise any potential problems and obtain consent to watering events. In many situations landholders support watering events because the outcomes are mutually beneficial, such as by creating environmental benefits while also supporting the productivity of floodplain pastures.

- **Equal treatment:** Commonwealth environmental water is delivered by river operators within the current operating framework that applies to all types of water deliveries. Commonwealth environmental water is subject to fees and charges and receives the same allocations as equivalent entitlements held for consumptive use. The underlying entitlement characteristics should not be changed; however, the operating rules which enable water use should continue to evolve to meet the needs of all water users, just as they always have.

- **Flexibility:** At times of critical environmental need, the Commonwealth may assert its rights to access its share of channel capacity. However, in the event of channel capacity becoming limited, we can be flexible about how and when environmental water is ordered so as to minimise any potential impact on others.

Case study – Managing limited channel capacity through the active management of environmental water

Environmental watering is actively managed by the Office and its delivery partners in a manner that is flexible about when and how environmental water is ordered. The Office seeks to maximise environmental outcomes but to also preserve the rights of other water entitlement holders. For this reason, operational decisions are often made to reduce or cease environmental water orders in consideration of potential impacts on other water holders.

During 2014–15, the regulated supply of water through the Barmah Choke was limited to channel capacity. To protect the rights of other water holders, concessions were made by the Office, in consultation with delivery partners, where environmental water was only delivered using the spare channel capacity remaining after other consumptive water orders and river operational requirements were met.

This approach does have implications for achieving environmental outcomes in the long term and as such the Office may at times assert their right for equitable treatment on the basis of critical environmental need. However, in the case of operational decisions in 2014–15, priority water access was afforded to consumptive water users and the supply of South Australian entitlement flow.

1.3. The Basin Plan and requirements for the Commonwealth Environmental Water Holder

The Basin Plan is a high-level plan for ensuring that the Basin's water resources are managed in an integrated and sustainable way. Key components include sustainable limits on surface water and groundwater extraction (referred to as 'sustainable diversion limits' or SDLs); an environmental watering plan; a water quality and salinity management plan; water resource plan requirements; water trading rules; and a monitoring and evaluation programme.

The Basin Plan's environmental watering plan requires the Commonwealth Environmental Water Holder to perform its functions and exercise its powers in a way that is consistent with both the environmental watering plan and the Basin-wide environmental watering strategy.

Commonwealth environmental watering must:

- be consistent with the environmental watering plan's objectives
- have regard to the Basin annual environmental watering priorities
- be in accordance with the principles to be applied in environmental watering, which include maximising environmental outcomes, having regard to risks and costs, working effectively with local communities, and applying adaptive management and the precautionary principle
- have regard to the water quality and salinity targets for managing flows.

Trade of environmental water must undertaken consistent with the Basin Plan's water trading rules, including that arrangements be in place to avoid trading on the basis of non-public information that may have a material impact on a person's decision to trade.

The Basin Plan also places a number of other obligations relating to the Commonwealth Environmental Water Holder's monitoring, evaluation and reporting activities.

1.4. Working with delivery partners

Commonwealth environmental water is delivered by a range of delivery partners, including state governments, catchment management authorities, regional and local land managers, non-government organisations and river operators. These partners deliver water for all water users in accordance with the rules and regulations governing the delivery of water in each water source.

These portfolio management plans are developed in consultation with state government departments and agencies, river operators, catchment management and land service agencies, local environmental watering advisory groups, wetland managers, holders of environmental water, landholders and communities, and the Murray-Darling Basin Authority (MDBA).

1.5. Working with communities

Local information and experience is critical to being able to effectively manage and deliver Commonwealth environmental water. We are very grateful for the expertise, advice, feedback and support provided by our delivery partners, environmental water holders and members of regional advisory groups who invite us to participate in their processes, and the many landowners who work with us to plan, manage and monitor the use of environmental water in the Basin.

1.6. Local Engagement Officers

The Commonwealth Environmental Water Holder now has six local engagement officers working within the Murray-Darling Basin, to assist members of the community to participate in environmental water planning and decision making. These six officers, alongside other officers of local land and water management agencies, will work closely with all levels of government as well as local communities and businesses across a range of catchments for which they have responsibility. For further information please refer to:

http://www.environment.gov.au/water/cewo/local-engagement

1.7. Supporting multiple outcomes

While the primary purpose of any Commonwealth environmental watering action is to achieve environmental outcomes, there are also opportunities to support complementary social, cultural and economic outcomes. Providing environmental water to rivers, wetlands and floodplains can support recreational and tourism activities (such as fishing, birdwatching, boating/kayaking and camping), improve water quality and create a more sustainable environment to underpin commercial activities. In planning environmental watering actions, the Office welcomes local community groups' and local governments' ideas and advice on opportunities for achieving complementary social and economic outcomes. This could include providing information on important local wetlands, recreational activities or tourism events.

The Office recognises and acknowledges that the traditional owners and their Nations in the Murray-Darling Basin have a deep cultural, social, environmental, spiritual and economic connection to their lands and waters. The concept of cultural flows has been developed to help translate this complex relationship into the language of water planning and management. The Northern Murray-Darling Basin Aboriginal Nations and the Murray Lower Darling Rivers Indigenous Nations have adopted the following definition of cultural flows: "Water entitlements that are legally and beneficially owned by the Indigenous Nations and are of sufficient and adequate quantity to improve the spiritual, cultural, environmental, social and economic conditions of those Indigenous Nations. This is our inherent right"[1].

While environmental flows are not cultural flows, there are opportunities to support complementary cultural outcomes through environmental water use. For this reason, the Office engages with Indigenous nations to identify such opportunities and welcomes interested Indigenous communities or organisations bringing forward proposals.

1.8. Contact information

The Office welcomes information from the community on how environmental water can best be managed. If you have any comments or suggestions, please call 1800 218 478 or send an email to: ewater@environment.gov.au

[1] *Echuca Declaration*, as adopted by Northern Murray-Darling Basin Aboriginal Nations and the Murray Lower Darling Rivers Indigenous Nations on 19 May 2010.

2. Portfolio management planning

The Office has adopted a new approach to planning for 2015–16. Reflecting the continuing evolution in environmental water management, this new approach:

- integrates the planning for the use, carryover and allocation trade (including purchase, sale and transfers) of Commonwealth environmental water into a single process
- provides greater detail around the longer-term context that informs portfolio management planning, including:
    - identifying the long-term flow regime required to meet environmental demands
    - documenting the recent watering history and its impact on environmental demands and asset condition
    - documenting the implications for portfolio management intentions for 2015–16 and the following two years.

Consistent with the Office's adaptive management of Commonwealth environmental water, these plans will be periodically reviewed throughout the year in light of changes in water availability, environmental demands, constraints, risks and market conditions. The portfolio management plans will be updated each year, while more frequent portfolio management statements will be made available on the Office's website every three months.

It is important to note that trade of environmental water entitlements is not included in this process. Unlike allocation trade, which allows holders to be responsive to annual water demands, entitlement trade is used to re-balance the portfolio based on improvements in the knowledge of long-term environmental water demands.

2.1. Purpose of portfolio management planning

The Commonwealth Environmental Water Holder seeks to maximise environmental outcomes at a Basin-scale and over the long-term through the efficient, effective and transparent management of the Commonwealth environmental water portfolio.

This requires the utilisation of all portfolio management options: use, carryover and trade. To support improved outcomes from water use over time, carryover provides the opportunity to optimise water use across water years and to improve water availability early in a water year. Allocation trade (buying or selling) provides further capacity to optimise use over the long-term as well as across catchments.

Through multi-year integrated planning, portfolio management tools such as use, carryover and trade can be strategically managed. Integrated portfolio management planning will also support the Commonwealth Environmental Water Holder in:

- meeting Basin Plan obligations and contributing to the long-term objectives of the environmental watering plan, the expected outcomes in the Basin-wide environmental watering strategy and Basin annual environmental watering priorities
- managing the Commonwealth environmental water portfolio in response to the demands identified by Basin States in long-term environmental watering plans (once available)
- applying adaptive management (including the setting of objectives, evaluating outcomes and informing future decision making)
- providing increased transparency in relation to the Commonwealth Environmental Water Holder's portfolio management (use, trade and carryover) behaviour
- coordinating water use with delivery partners, including developing long-term delivery arrangements.

2.2. Commonwealth Environmental Water Portfolio Management Framework—planning based on Demand and Supply

The Commonwealth Environmental Water Portfolio Management Framework allows for planning based on two key factors:

1) demand according to environmental conditions: watering needs of plants and animals are determined, based on scientific and local stakeholder input. Extended dry conditions commonly result in high demand for water whilst multiple wet years or successful environmental watering events typically result in low demand.

2) water availability to meet environmental demands: the scope of watering actions and the environmental outcomes that can be achieved can be limited by availability of water. Environmental needs can be met from a range of sources, and Commonwealth environmental water is delivered in conjunction with natural flows, consumptive water, and other sources of environmental water.

By considering these factors together, the Office can determine an overall purpose, ranging from 'avoiding damage' to the environment through to 'improving' ecological condition (Figure 1). These two factors also help to determine the mix of portfolio management options that might be most suitable for maximising environmental outcomes in different conditions (Figure 2).

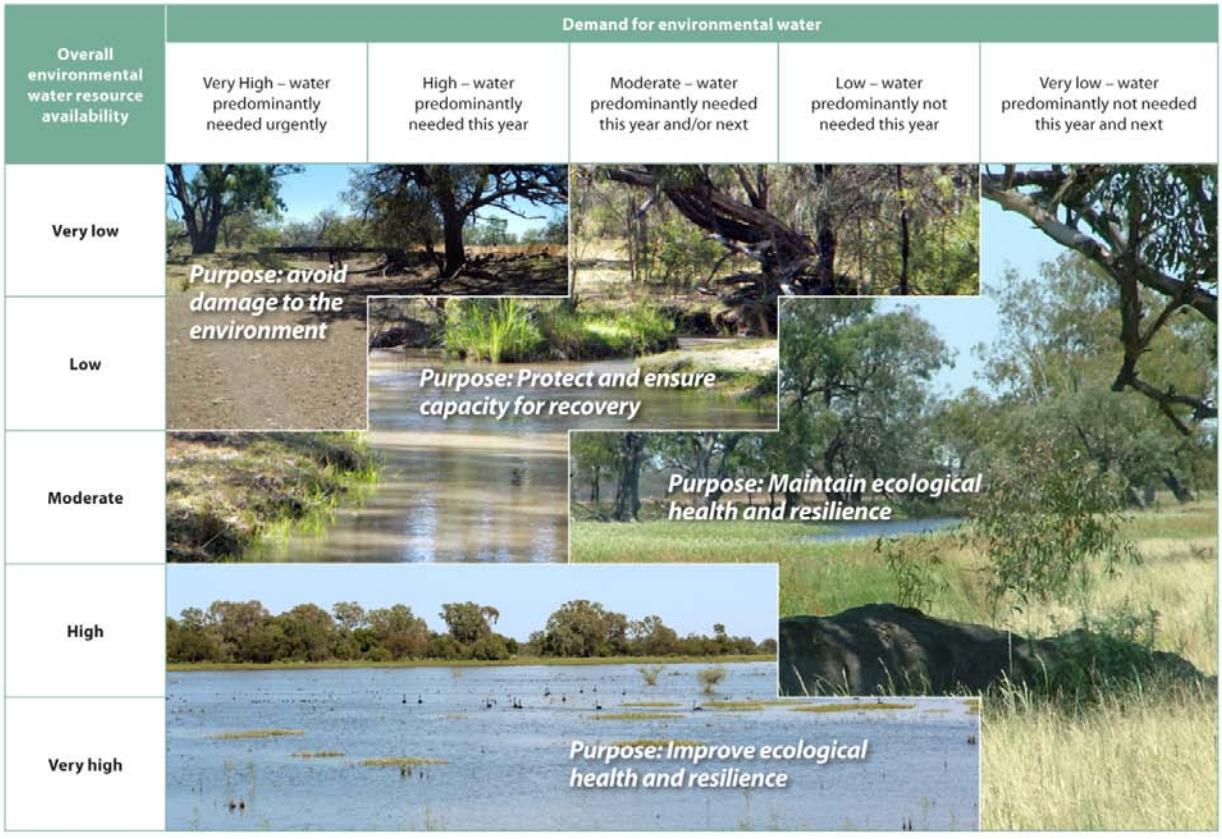

Figure 1: Environmental demand and water available influence the purpose of Commonwealth environmental water management

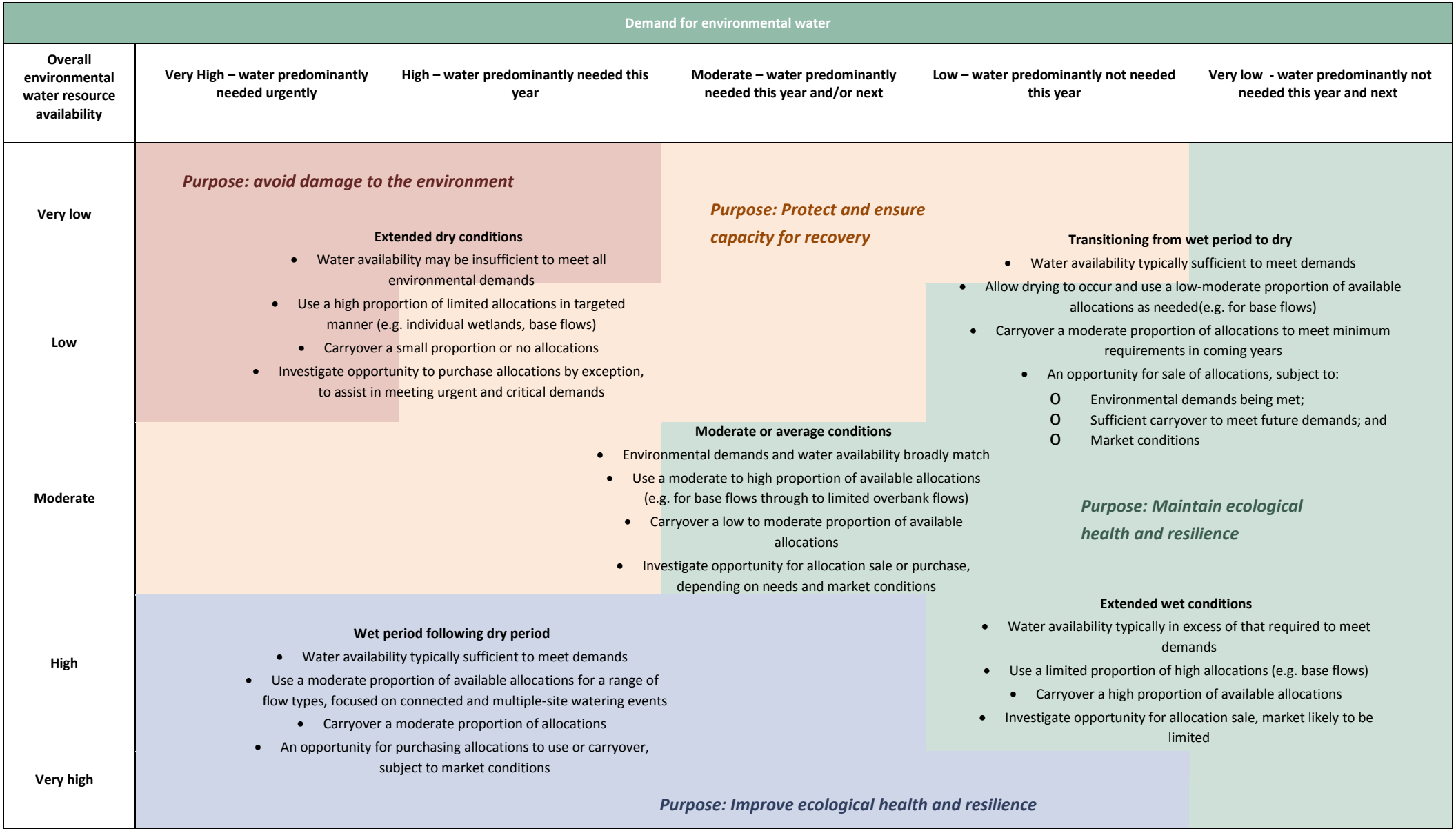

Figure 2: Examples of how environmental demand and water availability shape planning for the mix of portfolio management options for maximising environmental outcomes in different conditions

Note: the portfolio management actions in each scenario represent generic examples and the specific approach taken in individual catchments and conditions will vary

2.3. Environmental water demands

The Basin Plan's environmental watering plan establishes the objectives, processes and principles that guide the management of water by the MDBA, Basin States and the Commonwealth Environmental Water Holder to achieve environmental outcomes. The environmental watering plan and the subsidiary documents provide key inputs into the Office's portfolio management planning, particularly in identifying the long-term and annual environmental demands in the Basin.

Basin-wide long-term environmental demands

The overall environmental objectives for the water-dependent ecosystems of the Murray–Darling Basin are:

- to protect and restore the Basin's water-dependent ecosystems
- to protect and restore the ecosystem functions of water-dependent ecosystems
- to ensure that water-dependent ecosystems are resilient to risks and threats.

These objectives are intended to be understood in the context of a working Basin. The fact that water storages and property, including floodplains, are under the control of various people will restrict the capacity to actively manage all water-dependent ecosystems.

The Basin-wide environmental watering strategy (available from: http://www.mdba.gov.au/media-pubs/publications/basin-wide-environmental-watering-strategy) builds on these environmental objectives and sets out the Murray-Darling Basin Authority's best assessment of the expected environmental outcomes over the next decade as a result of implementing the Basin Plan and associated water reforms. The Strategy focuses on four components: river flows and connectivity; vegetation; waterbirds; and native fish. The expected outcomes for each component are summarised below, with more specific quantified outcomes provided in **Attachment A**.

- River flows and connectivity: Improve connections along rivers and between rivers and their floodplains
- Vegetation: Maintain extent and improve the condition
- Waterbirds: Maintain current species diversity, improve breeding success and numbers
- Native Fish: Maintain current species diversity, extend distributions, improve breeding success and numbers.

Commonwealth environmental watering must be consistent with both the objectives of the environmental watering plan and the expected environmental outcomes in the Basin-wide environmental watering strategy. The Commonwealth Environmental Water Outcomes Framework has been designed to be able support this.

The Outcomes Framework sets out a hierarchy of expected outcomes, which are matters that the best available science indicates can be achieved from environmental watering:

- within a one year timeframe (1 year expected outcomes)
- within a one year to five year timeframe (5 year expected outcomes).

The cumulative implementation of these shorter-term outcomes over successive years is expected to contribute to the longer term objectives and outcomes in the environmental watering plan and the Basin-wide environmental watering strategy (see Figure 3). For further information please refer to: http://www.environment.gov.au/water/cewo/publications/environmental-water-outcomes-framework

Table 1: Commonwealth Environmental Water Outcomes Framework

Basin Plan Objectives	Basin Outcomes		Basin Wide Environmental Watering Strategy – Expected Outcomes	5 year Expected Outcomes	1 year Expected Outcomes
Biodiversity (Basin Plan S. 8.05)	Ecosystem diversity			• Species diversity	
	Species diversity	Vegetation	• Maintenance of the current extent of river red gum, black box, coolibah forest and woodlands; existing large communities of lignum; and non-woody communities near or in wetlands, streams and on low-lying floodplains • Maintain the current condition of lowland floodplain forests and woodlands of river red gum, black box and coolibah • Improved condition of southern river red gum	• Vegetation diversity • Growth and survival	• Reproduction • Condition • Germination • Dispersal
		Macroinvertebrates		• Macroinvertebrate diversity	
		Fish	• Improved distribution of key short and long-lived fish species across the Basin • Improved breeding success for short-lived species, long-lived species and mulloway • Improved populations of short-lived species, long-lived species, Murray cod and golden perch	• Fish diversity • Larval and juvenile recruitment	• Condition • Larval abundance • Reproduction
		Waterbirds	• Maintained current species diversity of all current Basin waterbirds and current migratory shorebirds at the Coorong • Increased abundance with a 20–25 per cent increase in waterbirds by 2024 • Improved breeding events for colonial nesting waterbird species and an increase in nests and broods for other waterbirds	• Waterbird diversity • Waterbird population condition (Abundance and Population structure)	• Survival and condition • Chicks • Fledglings
		Other vertebrate diversity		• Adult abundance	• Young
Ecosystem Function (Basin Plan S. 8.06)	Connectivity		• Maintained base flows - at least 60 per cent of natural levels • Improved overall flow • Maintained connectivity in areas where it is relatively unaffected • Improved connectivity with bank-full and/or low floodplain flows • Maintain the Lower Lakes above sea level		• Hydrological connectivity including end of system flows
			• Improved movement with more native fish using fish passages		• Biotic dispersal and movement
					• Sediment transport

	Process				• Primary productivity (of aquatic ecosystems) • Decomposition • Nutrient and carbon cycling
	Water quality	Chemical			• Salinity • Dissolved oxygen • pH • Dissolved organic carbon
		Biological			• Algal blooms
Resilience (Basin Plan S. 8.07)	Ecosystem resilience			• Population condition - individual refuges - landscape refuges - ecosystem recovery	• Individual survival and condition (Individual refuges) • Individual condition (Ecosystem resistance)

Catchment long–term environmental demands

Under the environmental watering plan, state governments are required to develop long-term watering plans for each catchment in the Basin. These plans will identify:

- the priority environmental assets and ecosystem functions in the catchment
- the objectives and targets for these assets and functions
- their watering requirements

In developing these plans, state governments will be consulting with environmental water holders and local communities.

Once developed, these plans will provide the key information on the long-term environmental water demands at the catchment-scale. Prior to the development of long-term watering plans, the Office will continue to draw on existing documentation on environmental water demands developed by state governments, local natural resource management agencies and the Murray-Darling Basin Authority.

Annual environmental water demands

Prior to the start of the each new water year, the MDBA must publish Basin annual environmental watering priorities. All environmental watering must be undertaken having regard to the priorities.

These are developed having regard to the annual environmental watering priorities developed by Basin States for each catchment.

The Office has also been consulted in the development of the priorities for 2015–16. Through an iterative process, the Office's development of portfolio management plans for Commonwealth environmental water in 2015–16 has informed the development of, and been informed by, the Basin annual environmental watering priorities.

The Basin annual environmental watering priorities for 2015–16 are identified below (with more detailed information available at: http://www.mdba.gov.au/media-pubs/publications/basin-annual-environmental-watering-priorities-2015-16).

Basin-wide flow variability and longitudinal connectivity: Provide flow variability and longitudinal connectivity within rivers to support refuge habitats**.**

River Murray weir pool variation: Ensure a variable flow pattern and lateral connectivity through coordinated weir pool management in the River Murray from Euston to Blanchetown.

Coorong, Lower Lakes and Murray Mouth: Improve water quality, fringing vegetation and native fish movement by varying the water levels in Lakes Alexandrina and Albert to maintain flows into the Coorong and Murray Mouth.

Basin-wide in-stream and riparian vegetation: Maintain and where possible improve the condition of in-stream riparian vegetation, through in-channel freshes.

Mid-Murrumbidgee Wetlands: Improve the condition of wetland vegetation communities in the mid-Murrumbidgee wetlands.

Macquarie Marshes: Maintain semi-permanent wetland vegetation in core refuge areas in the Macquarie Marshes**.**

Moira grass: Maintain the condition and range of Moira grass in Barmah–Millewa Forest by supplementing a natural event and extending the duration of inundation.

Basin-wide waterbird habitat and future population recovery: Improve the complexity and health of priority waterbird habitat to maintain species richness and aid future population recovery.

Basin-wide native fish habitat and movement: Maintain native fish populations by protecting and improving the condition of fish habitat and providing opportunities for movement.

Northern Basin fish refuges: Protect native fish populations and in-stream habitats, particularly drought refuges, in the northern Basin.

Silver perch: Contribute to the long-term recovery of silver perch by maintaining key populations, supporting recruitment and facilitating movement and dispersal.

Commonwealth environmental watering actions will seek to contribute to the Basin annual environmental watering priorities, subject to conditions as they unfold throughout the year.

2.4. Environmental water supply

Commonwealth environmental water holdings

The total volume of Commonwealth environmental water holdings as at 31 May 2015 was 2,289 GL, which has a long-term average annual yield of 1,576 GL. The holdings will continue to grow, with the final volume of the holdings dependent on the implementation of the Basin Plan's sustainable diversion limit adjustment mechanism.

The holdings are a mix of entitlement types including high, general, medium and low security, conveyance, supplementary, unsupplemented/unregulated, overland flow and groundwater. The entitlements are held across the Basin.

Complementary water resources

Commonwealth environmental water is not managed in isolation. When considering the available resource to meet environmental demands, it is necessary to also factor in the resources managed by other entities that is available to contribute to environmental outcomes. Relevant resources include held environmental water, planned environmental water, conveyance water and consumptive water. For this reason, portfolio management planning is undertaken in conjunction with other environmental water holders and river operators.

2.5. Basin-scale analysis

Portfolio management plans are developed for individual planning regions, based on supply and demand as described above, before being considered together as part of a Basin-scale analysis. This analysis aims to identify opportunities to use allocation trade (purchase, sale or transfer) to

rebalance the portfolio to better match differing demands across catchments or for connecting watering events across catchments via multi-site watering, where possible. The initial plans for individual planning regions are then updated as required to reflect this Basin-scale analysis.

2.6. Constraints to Commonwealth environmental watering

Constraints are river management practices and structures that govern the volume and timing of regulated water delivery through the river system. They can be:

- physical restrictions, like low-lying bridges or roads
- areas of private land that might be adversely impacted by high regulated flows
- river rules or practices that limit how environmental water can be delivered.

Not all environmental demands can and will be met through the use of held environmental water. Some demands are met by regulated water deliveries for consumptive purposes, while others are met by large unregulated/natural flows events or are beyond what can be delivered within operational constraints. Infrastructure can often be used to deliver water to individual wetlands that would otherwise not be possible due to constraints.

River operators have an important role to play in the delivery of environmental water. Operators are required to deliver water to their customers within the established river management practices. River operators manage environmental water with the same diligence and caution that they deliver irrigation and town water. This includes continually appraising any risks, forecasting rainfall events and tributary inflows against peak regulated operating levels and being careful to avoid any possible impacts while delivering water.

Environmental water holders work with operators in real time to vary delivery to avoid third party impacts while still getting the best environmental outcomes. The Commonwealth Environmental Water Holder takes a cautious approach to environmental flow management in order to eliminate, to the fullest extent practical, the risk of unintended impacts on landholders, irrigators and other third parties, while still delivering positive environmental outcomes.

Constraints relaxation

Basin State governments are working with the Murray-Darling Basin Authority to look at ways to reduce the limitations that constraints place on the use of environmental water and so improve environmental outcomes for the Basin. This work aims to improve the efficiency and/or effectiveness of environmental watering and get better environmental results for wetlands and rivers while avoiding, managing or mitigating impacts to local communities and industries.

Key areas have been identified as a focus for constraints relaxation. Basin State governments and the Murray-Darling Basin Authority are progressing work on constraints in consultation with local communities located in key areas. During 2015, more detailed information and ideas will collected around where water flows if some of the key constraints are addressed and what that means for local communities. Governments will also be working with communities to understand how to best avoid or mitigate any potential adverse impacts as well as the costs of addressing these to the satisfaction of affected communities. Any decision to remove or modify constraints will ultimately be a decision of Basin governments.

The Office does not deliver water to maximum constraints all the time and most often delivers water in line with natural cues. Until such a decision is made to change constraints, Commonwealth environmental water will continue to be delivered within existing constraints.

3. From planning to decision-making

Following the planning process outlined above, a number of factors specific to local conditions within catchments influences decision–making around water delivery, carry over and trade (Figure 3).

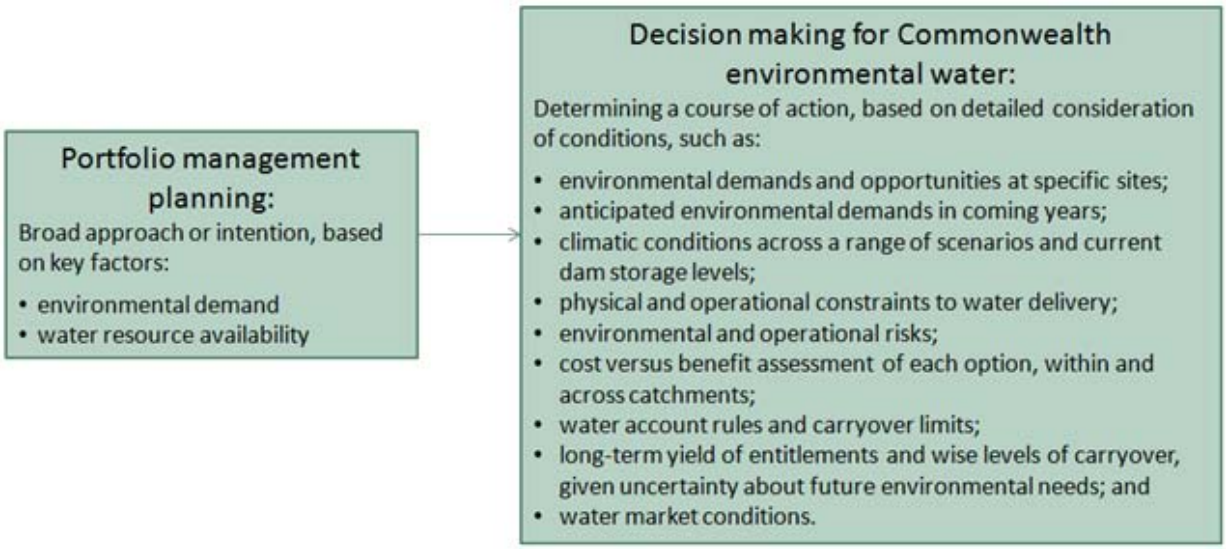

Figure 3: Factors informing planning and decision-making for Commonwealth environmental water

Local knowledge and experience is critical to effectively manage and deliver Commonwealth environmental water. Stakeholders have an important role and provide critical information that informs each stage of the process for managing Commonwealth environmental water.

3.1. Commonwealth environmental watering decisions

The planning phase is the first stage in the cycle of environmental water management. The planning process occurs on an annual basis between January and the end of June, and each planning document represents the culmination of months of work and consultation. Throughout the planning process, the Office consults closely with state environmental water managers, river operators and local environmental water advisory groups. The information gathered as part of the planning process feeds into the development of watering intentions for the following water year.

Towards the beginning of the new water year, the focus shifts from planning to implementation. Greater consideration is given to current and forecast catchment conditions and water availability to determine whether the watering intentions identified during the planning process can feasibly be implemented. Local on-ground knowledge is important for detailing a specific watering action including the flow magnitude, timing, triggers for commencement, rates of rise and fall and the area to be inundated.

Once an action has been scoped in more detail, an assessment is undertaken against the following criteria:

- ecological value of the river, floodplain or wetland
- expected outcomes from watering
- potential risks of watering
- long-term sustainability and management of the site
- cost effectiveness and feasibility of watering.

Following the scoping and assessment of potential watering actions, the Commonwealth Environmental Water Holder is required to make a decision on whether or not to commit the water and funds required to support the watering action. In doing so, the Commonwealth Environmental Water Holder also has regard to the Basin annual environmental watering priorities, as required by the Basin Plan.

When a decision is made by the Commonwealth Environmental Water Holder to proceed with a watering action, arrangements for implementation are made with delivery partners. This includes river operators, who manage the delivery of the water and operational monitoring. Local community involvement is crucial at this stage of implementation and during water delivery as conditions can change rapidly and may result in the need to adjust, suspend or even cancel the watering action.

Upon completion of the watering action, a review process, which generally takes place from March through to October, informs future watering actions and long term management. This review is informed by the weekly operational monitoring, results of ecological monitoring, and feedback provided by site managers and the local community.

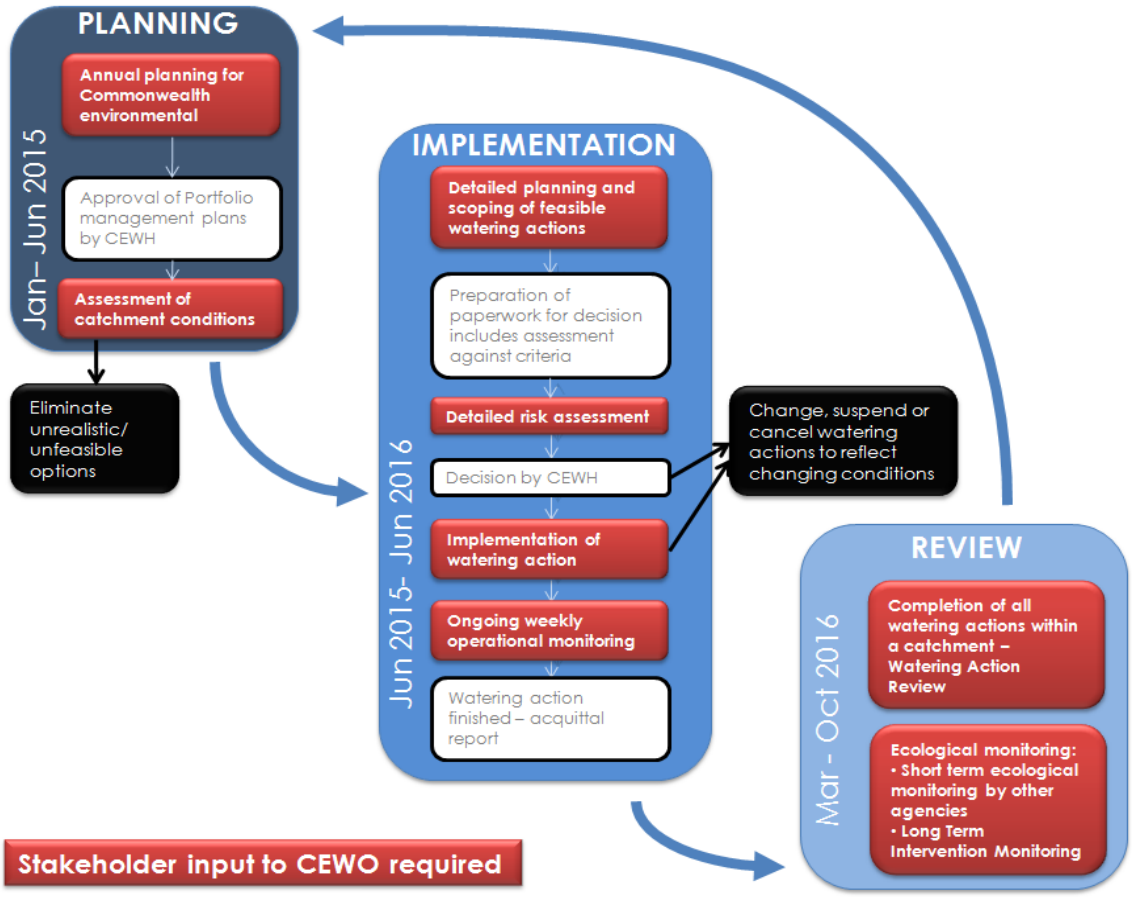

Figure 4: The annual management process for Commonwealth environmental water

For further information see the *Framework for Determining Commonwealth environmental water use* (available at: www.environment.gov.au/water/cewo/publications/framework-determining-cew-use).

3.2. Carryover decision-making

Carryover rules are set by States and vary markedly for different entitlements and in different water plan areas across the Basin. The carryover limits, account limits and use limits apply to all entitlement holders including the Commonwealth. When making carryover decisions, considerations include:

- minimising the risk of water being reallocated under State rules by carrying over water in accounts with better carryover provisions
- having sufficient water in accounts for environmental watering actions that occur early in a water year
- considering the cost-effectiveness with regard to the cost of water delivery and transfer fees against the potential market cost of water being reallocated under State rules
- considering the risk of carryover of water in accounts that may be subject to trade restrictions through the following water year.

3.3. Trade of environmental water allocations

Decisions to trade water allocations are made by the CEWH with the intention of enhancing the capacity of the water holdings to meet environmental objectives, as required under the s.106 of the Water Act. The decision to trade water will be made after considering: the current and forecast volume of water available in Commonwealth accounts; the balance of available environmental water (supply) to meet identified environmental demands; and (where appropriate) the prudent level of carryover. Decisions to trade also includes undertaking a market assessment, which informs the mechanisms available to trade water, the volume of water to be pursued or made available from the holdings, the price at which the CEWH is willing to enter the market and (in the case of purchases) the available budget.

The process for conducting a trading action is shown in Figure 5.

The process is underpinned by a trading framework that includes operating rules, protocols and procedures. The trading framework has been developed to ensure that the CEWH's trading activities:

- support enhanced environmental outcomes
- have regard to social and economic outcomes
- consider impacts on the market, including any third-party impacts
- are undertaken in a manner which meets legislative requirements
- are financially responsible, fair, equitable, transparent and accountable.

The trading framework, operating rules, protocols and procedures also ensure that the Commonwealth Environmental Water Holder and the Office's staff act with integrity and high ethical standards throughout the process. More information on the *Commonwealth Environmental Water Trading Framework* can be accessed here:
http://www.environment.gov.au/water/cewo/trade/trading-framework

Consistent with the operating rules, the Office publishes information on current trading actions as well providing quarterly updates on Commonwealth Environmental Water Holder trading intentions.

Information on current trading actions is available at:
http://www.environment.gov.au/water/cewo/trade/current-trading-actions.

Portfolio management and trading intentions updates are available at:
http://www.environment.gov.au/water/cewo/portfolio-mgt

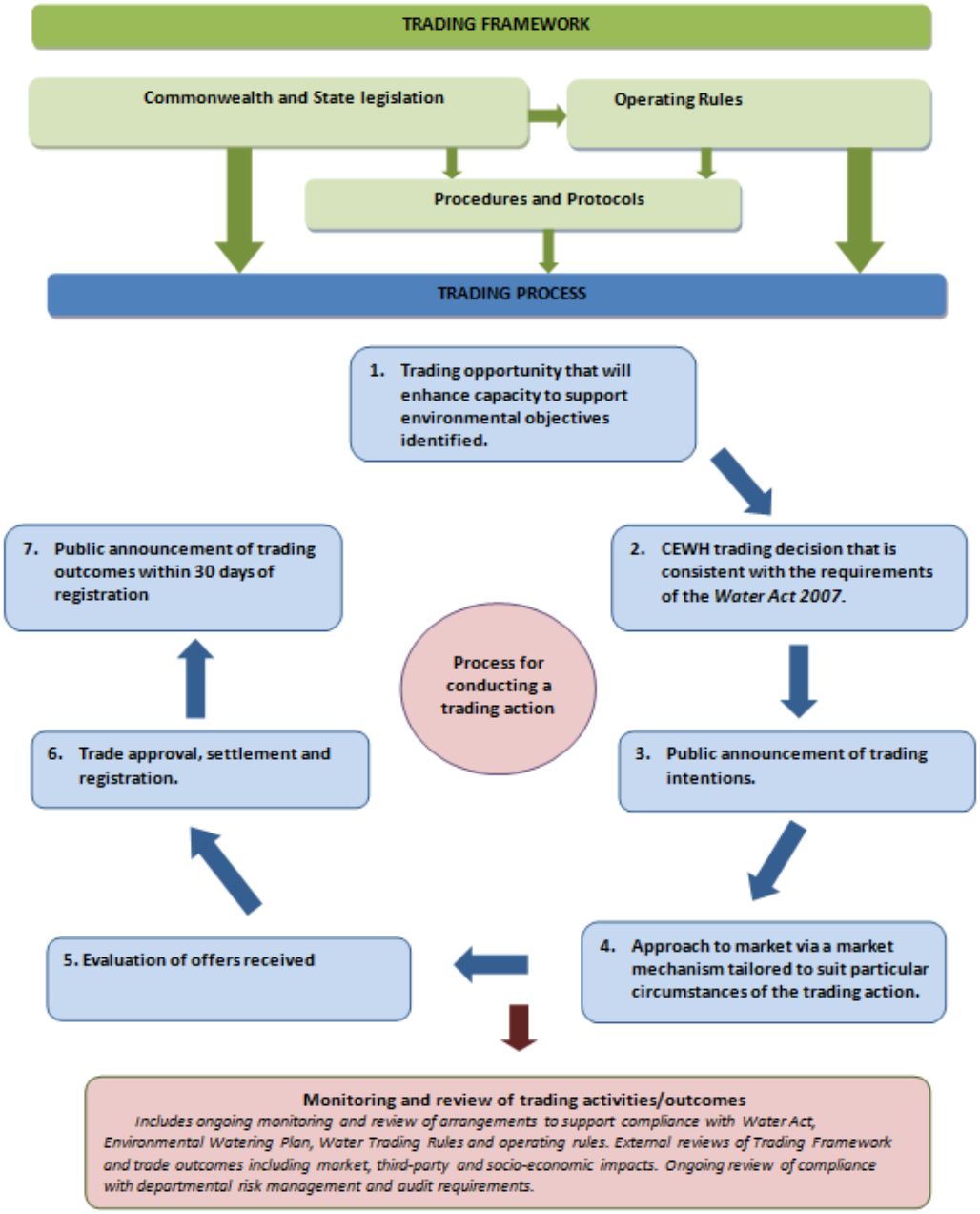

Figure 5: The process for conducting a Commonwealth environmental water trading action.

3.4. Independent Review of the *Water Act 2007*

On 19 December 2014, the Australian Government tabled the Water Act Review. The independent expert panel made a number of findings and recommendations, all of which are designed to improve the operation of the Water Act and ensure that it delivers on its objects more effectively and efficiently.

The Panel has recommended increasing the range of activities that can be funded from the sale of Commonwealth environmental water allocations to include environmental investments, such as carp exclusion screens in wetlands, that maximise environmental watering outcomes. It also recommended a technical amendment to ensure greater consistency in the capacity to trade Commonwealth environmental water under a variety of different water accounting systems.

The Australian Government is considering whether the approach recommended by the Expert Panel could achieve better environmental outcomes from Commonwealth environmental water while maintaining the integrity of the Basin Plan, including the sustainable diversion limits over the longer term.

4. Monitoring and Evaluation

Monitoring and evaluation of Commonwealth environmental water use is undertaken in accordance with the Monitoring, Evaluation, Reporting and Improvement Framework, available on the Office's website at: www.environment.gov.au/water/cewo/monitoring. The framework is a high level document that provides overarching guidance for the development and implementation of monitoring and evaluation activities.

Consistent with the role under the Water Act and Basin Plan, monitoring and evaluation that the Office puts in place will focus on the environmental response to the use of Commonwealth environmental water, or what is known as intervention monitoring. How intervention monitoring of Commonwealth environmental water fits in with operational monitoring and broad scale monitoring under the Basin Plan is shown in Figure 6.

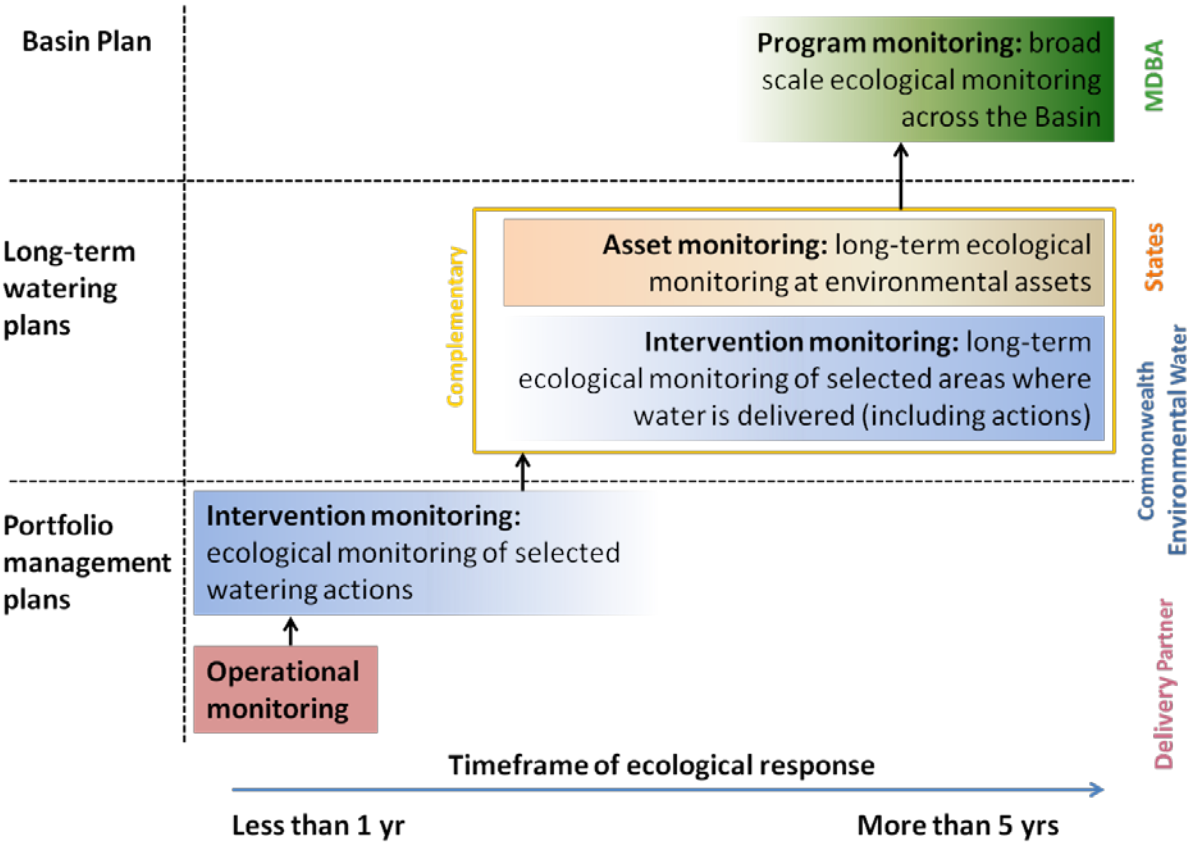

Figure 6: Operational and broad-scale monitoring under the Basin Plan

4.1. Operational monitoring

Operational monitoring is monitoring that helps assess whether water has been delivered as planned (e.g. the volumes, timing (frequency and duration), location and flow rates of water delivered) and at a high level can include immediate environmental responses. Operational monitoring also helps to manage unintended consequences. Operational monitoring is undertaken for all watering actions, mostly by delivery partners in conjunction with the Office.

4.2. Intervention monitoring

Intervention monitoring is monitoring that supports an assessment of the ecological response to water use. The Office commissions intervention monitoring of selected watering actions to:

- demonstrate that Commonwealth environmental water is being managed well
- demonstrate environmental outcomes
- help managers of environmental water learn from experience and improve the delivery of water over time.

The focus of monitoring and evaluation has transitioned from short (one year) to longer term (five year) projects.

The Office has established long-term intervention monitoring at selected areas within the Murray-Darling Basin that commenced in 2014–15. The approach has a sound scientific basis that will allow us to translate the results of monitoring to other areas and identify the contribution to Basin Plan objectives. The seven areas where monitoring is being undertaken are:

- Gwydir River system (wetlands and floodplains)
- Lachlan River system (in-stream and on fringing wetlands)
- Murrumbidgee River system (in-stream, on fringing wetlands and floodplains)
- Edward-Wakool River system (in-stream and on fringing wetlands)
- Goulburn River (in-stream)
- Lower Murray River (in-stream)
- Junction of the Warrego and Darling rivers (in-stream and floodplains, as well as an indicator of upstream unregulated rivers).

These areas have been chosen to be broadly representative of Commonwealth environmental watering, and complement existing monitoring programmes in the Murray-Darling Basin, including The Living Murray programme and Basin state monitoring initiatives.

The Office will continue to publish on its website results from all monitoring and evaluation that has been commissioned. This includes producing an environmental water outcomes report, which summarises the overall environmental outcomes from Commonwealth environmental water use. Intervention monitoring will play an important role in informing future water use through adaptive management.

5. Adaptive management

Adaptive management is a systematic approach for deliberately learning from past actions, with the intent to continually improve future planning and actions. It relies on a combination of the latest information, including best available science and monitoring outcomes, and the knowledge, insights and experiences of those people living and working in the Basin. As outlined in the Murray-Darling Basin Plan, adaptive management involves the following:

- setting clear objectives
- linking knowledge (including local knowledge) management, evaluation and feedback over time
- identifying and testing uncertainties
- using adaptive management as a tool to learn about the relevant system and change its management
- improving knowledge and ongoing implementation
- having regard to the social, economic and technical aspects of management.

The development of portfolio management plans are a critical element of the Office's adaptive management process (see Figure 7). The plans set out the objectives and outcomes that environmental water is aiming to contribute to (based on input from government agencies, communities and scientists) and the actions required to achieve these outcomes. These are then updated each year based on the evaluation of monitoring results and the experience of what has worked well and areas that require improvement.

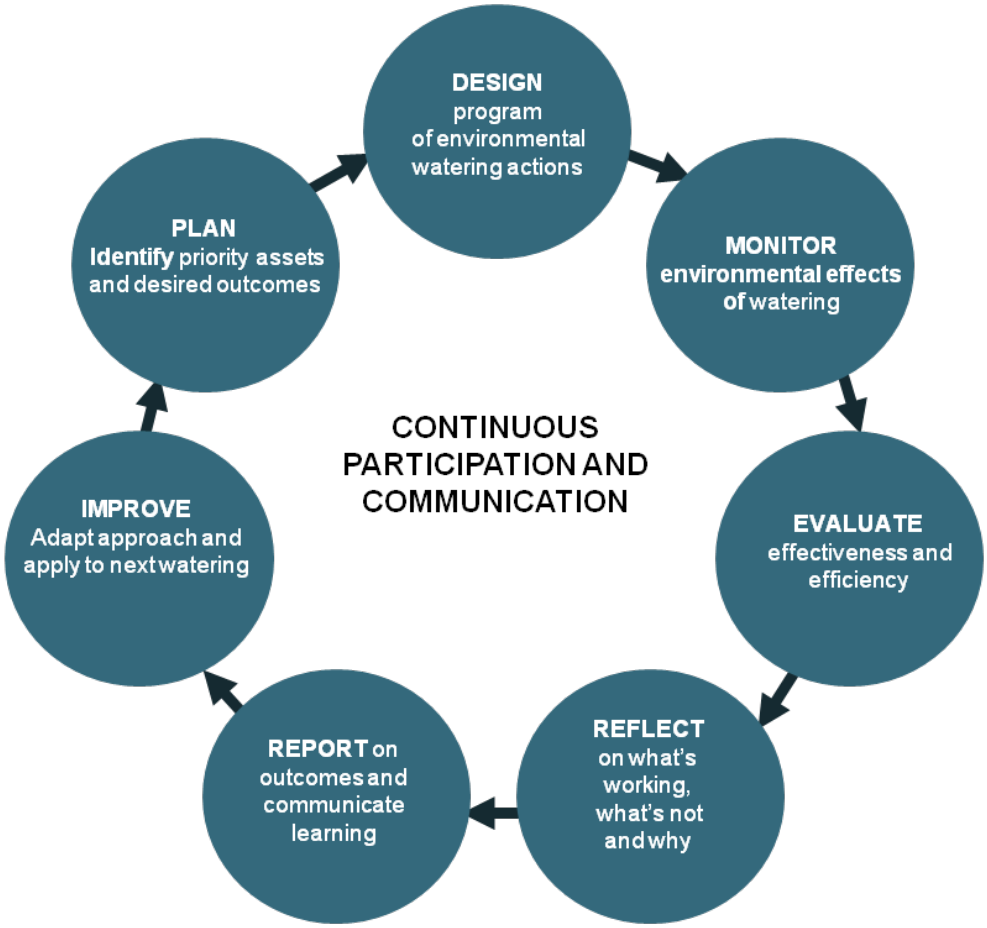

Figure 7: The adaptive management cycle

The practice of environmental water management will continue to evolve through the development of innovative and flexible approaches. This will help maximise environmental outcomes despite uncertainty over future conditions and changing circumstances.

Case Study: Adaptive management in practice in the Goulburn River

After considering results of November 2011, 2012, and 2013 spring environmental flows, the first spring environmental flow in 2014–15 was brought forward to October to benefit recovering bank vegetation (before the hot summer) and a second flow was then provided at a reduced rate, in late November, to allow golden perch fish larvae to develop, which resulted in a successful golden perch breeding event (Figure 8).

The timing of watering actions in 2014–15 were also modified to ensure environmental watering was completed before the opening of the Murray cod fishing season on 1 December 2014. This was deliberately arranged to minimise any disruption to angling activities in the area.

The design of environmental watering actions was also adjusted to minimise natural bank erosion processes, which was of concern to members of the local community. This was achieved through delivering a variable water flow that reduced more gradually compared with the previous year.

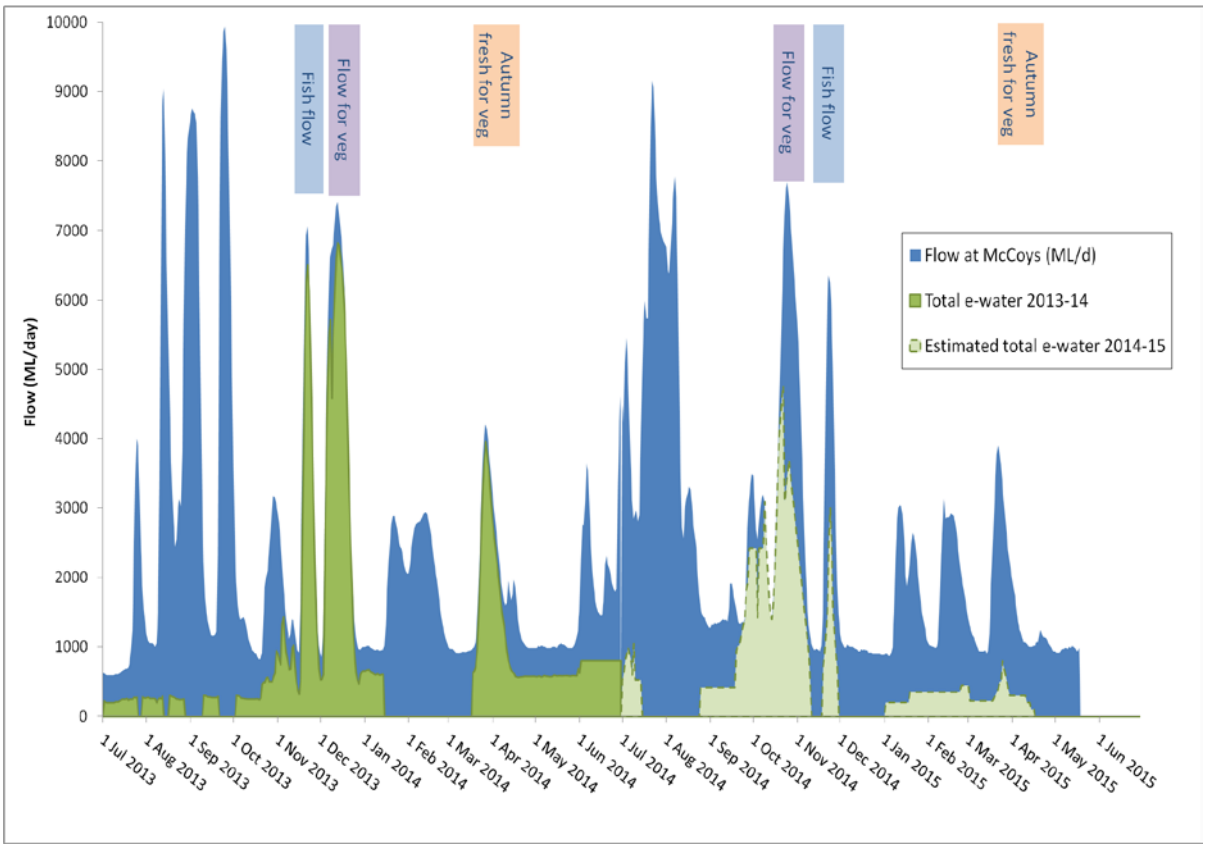

Figure 8: Hydrograph of the flow rate in the Goulburn River at McCoys Bridge, showing the contribution of Commonwealth environmental water and partners, and the timing and duration of flows

Attachment A: Basin–wide environmental watering strategy

The MDBA has identified the below list of quantified environmental expected outcomes that can be achieved beyond 2019 through the Basin-wide environmental watering strategy (http://www.mdba.gov.au/media-pubs/publications/basin-wide-environmental-watering-strategy).

River flows and connectivity	Vegetation	Waterbirds	Fish
Improve connections along rivers and between rivers and their floodplains	**Maintain the extent and improve the condition**	**Maintain current species diversity, improve breeding success and numbers**	**Maintain current species diversity, extend distributions, improve breeding success and numbers**
Maintained base flows: • at least 60 per cent of natural levels **Improved overall flow:** • 10 per cent more into the Barwon–Darling[2] • 30 per cent more into the River Murray[3] • 30–40 per cent more to the Murray mouth (and it open to the sea 90 per cent of the time) **Maintained connectivity in areas where it is relatively unaffected:** • between rivers and floodplains in the Paroo, Moonie, Nebine, Warrego and Ovens **Improved connectivity with bank-full and/or low floodplain flows:** • by 30–60 per cent in the Murray, Murrumbidgee, Goulburn and Condamine–Balonne • by 10–20 per cent in remaining catchments[4] **Maintain the Lower Lakes above sea level**	**Maintenance of the current extent of:** • about 360,000 hectares of river red gum; 409,000 ha of black box; 310,000 ha of coolibah forest and woodlands; and existing large communities of lignum • non-woody communities near or in wetlands, streams and on low-lying floodplains **Maintain the current condition of lowland floodplain forests and woodlands of**: • river red gum • black box • coolibah **Improved condition of:** • southern river red gum	**Maintained current species diversity of:** • all current Basin waterbirds • current migratory shorebirds at the Coorong **Increased abundance:** • 20–25 per cent increase in waterbirds by 2024 **Improved breeding:** • up to 50 per cent more breeding events for colonial nesting waterbird species • a 30–40 per cent increase in nests and broods for other waterbirds	**Improved distribution:** • of key short and long-lived fish species across the Basin **Improved breeding success for:** • short-lived species (every 1–2 years) • long-lived species in at least 8/10 years at 80 per cent of key sites • mulloway in at least 5/10 years **Improved populations of:** • short-lived species (numbers at pre-2007 levels) • long-lived species (with a spread of age classes represented) • Murray cod and golden perch (10–15 per cent more mature fish at key sites) **Improved movement:** • more native fish using fish passages

[2] Comprising tributary contributions from: Condamine–Balonne, Border Rivers, Gwydir, Namoi and Macquarie–Castlereagh

[3] Comprising tributary contributions from: Murrumbidgee, Goulburn–Broken, Campaspe, Loddon and Lower Darling

[4] Border Rivers, Gwydir, Namoi, Macquarie–Castlereagh, Barwon–Darling, Lachlan, Campaspe, Loddon and Wimmera

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