

Section 1

Introduction

1.1	The Victorian environmental watering program.....	1
1.1.1	Who is involved in the Victorian environmental watering program?	1
1.1.2	What is the program aiming to achieve?	2
1.1.3	What is the role of the Victorian Environmental Water Holder?	2
1.1.4	Where can I find more information about the Victorian environmental watering program?	2
1.1.5	Environmental watering fact sheets.....	2
1.2	The seasonal watering plan	3
1.2.1	What does 'seasonal' mean?	3
1.2.2	How does the seasonal watering plan fit in the planning process?	4
1.2.3	Who contributes to the seasonal watering plan?	5
1.2.4	Can the seasonal watering plan be changed?	5
1.2.5	What kinds of changes don't require a formal variation to the seasonal watering plan?	5
1.3	Managing available environmental water	6
1.3.1	How much water is available to use as part of the Victorian environmental watering program?.....	6
1.3.2	What options are available to effectively and efficiently manage environmental water?	9
1.4	Implementing the seasonal watering plan	12
1.4.1	How do program partners decide which watering actions are delivered?	12
1.4.2	When does the VEWH commit and authorise its water for use?	13
1.4.3	How are recreational, Indigenous cultural and economic benefits considered in environmental watering?.....	14
1.4.4	How are risks managed?	14
1.4.5	What if there is not enough environmental water available?	15

1.1 The Victorian environmental watering program

The Victorian environmental watering program is the ongoing collaborative management of water available under environmental entitlements and used to improve the health of Victoria's rivers and wetlands and the native plants and animals that depend on them.

This seasonal watering plan previews the potential environmental watering that may be delivered across Victoria under the program in the coming year.

In this section ...

- ▶ **Who is involved in the Victorian environmental watering program?**
- ▶ **What is the program aiming to achieve?**
- ▶ **What is the role of the Victorian Environmental Water Holder?**
- ▶ **Where can I find more information about the Victorian environmental watering program?**

1.1.1 Who is involved in the Victorian environmental watering program?

The Victorian environmental watering program involves a range of people and organisations. Relationships between local communities, waterway managers, storage managers, environmental water holders and land managers are the foundation of the program.

Many public authorities collaborate to deliver the program. These authorities are referred to as program partners.

Waterway managers (catchment management authorities [CMAs] and Melbourne Water) are the linchpin of the program. In consultation with local communities, waterway managers develop proposals for environmental watering in rivers and wetlands in their region. Waterway managers also order environmental water from storage managers and monitor the outcomes.

Storage managers (some water corporations) deliver water for all water users, including for waterway managers / environmental water holders.

Environmental water holders (the Victorian Environmental Water Holder [VEWH], Commonwealth Environmental Water Holder [CEWH] and the Murray-Darling Basin Authority [MDBA]) commit environmental water to different rivers and wetlands. They work together to ensure the coordinated delivery of water available under different environmental entitlements, and often have to prioritise across large regions (such as northern Victoria).

Public land managers (such as Parks Victoria, Department of Environment, Land, Water and Planning, and Traditional Owner land management boards) are closely involved in environmental water planning and delivery for public land such as state forests or national parks. They may have a variety of responsibilities including controlling infrastructure (such as pumps, outlets, gates and channels) and ensuring appropriate public signage.

To effectively manage environmental water, it is important to understand the environmental values of Victoria's rivers and wetlands. This understanding draws on the knowledge of local communities and scientists.

Local communities help to identify the important environmental values in each region, and help to monitor the success of environmental watering. Their input is important because they are often actively involved with local rivers and wetlands and bring a range of environmental, cultural, social and economic perspectives to the program.

Scientists provide indispensable advice about how environmental watering will support native plants and animals in the short and long terms, and work with waterway managers to monitor, evaluate and report on the outcomes of environmental watering.



Lower Ovens billabong, by North East CMA



Whiskered tern at Lake Murphy, by North Central CMA

1.1.2 What is the program aiming to achieve?

The Victorian environmental watering program seeks to collaboratively manage environmental water to improve the environmental values and health of water ecosystems, including their biodiversity, ecological functioning, water quality and other uses that depend on environmental condition.

1.1.3 What is the role of the Victorian Environmental Water Holder?

The VEWH is an independent statutory authority set up under the *Victorian Water Act 1989* to manage Victoria's environmental water entitlements (known as Water Holdings) to achieve environmental benefits for Victoria's rivers, wetlands and floodplains.

The role of the VEWH is to:

- ▶ make decisions about the most effective use of the environmental water entitlements, including use, carryover and trade (see section 1.3.2)
- ▶ commit water and authorise waterway managers to implement watering decisions (see section 1.4.2)
- ▶ work with storage managers and other water holders to coordinate and maximise environmental outcomes from the delivery of all water (see section 1.3)
- ▶ commission projects to demonstrate the ecological outcomes of environmental watering at key sites and to help improve environmental water management
- ▶ publicly communicate environmental watering decisions and outcomes.

The VEWH consists of three part-time Commissioners, supported by a small team.

The Commissioners are Denis Flett (Chairperson), Geoff Hocking (Deputy Chairperson) and Chris Chesterfield (Commissioner). Commissioners were appointed by the Governor in Council on the recommendation of the Minister for Environment and Climate Change.

1.1.4 Where can I find more information about the Victorian environmental watering program?

More information about the program can be found on the VEWH website at www.vewh.vic.gov.au or by contacting VEWH on (03) 9637 8951 or by email to general.enquiries@vewh.vic.gov.au.

More detailed information about environmental watering in a specific region of Victoria can be found by contacting your local waterway manager using the contact details (Section 6.3).

1.1.5 Environmental watering fact sheets

The VEWH has produced a series of fact sheets which seek to answer questions people have about environmental watering, including:

- ▶ What is environmental water?
- ▶ Why is environmental watering important?
- ▶ What does environmental watering aim to achieve?
- ▶ What does environmental watering involve?
- ▶ How do we know if environmental watering is successful?

These fact sheets can be found on the VEWH website and hard copies can be requested by email to general.enquiries@vewh.vic.gov.au.

1.2 The seasonal watering plan

The seasonal watering plan is a statewide plan that guides environmental watering decisions in Victoria. It provides program partners, stakeholders and communities with a sense of what to expect during the water year.

In this section ...

- ▶ **What does ‘seasonal’ mean?**
- ▶ **How does the seasonal watering plan fit into the planning process?**
- ▶ **Who contributes to the seasonal watering plan?**
- ▶ **Can the seasonal watering plan be changed?**
- ▶ **What kinds of changes don’t require a formal variation of the plan?**

The plan previews the potential environmental watering that could be implemented using water available under all environmental water entitlements held in Victoria. This includes water available under the VEWH’s environmental water entitlements and water held by other environmental water holders (see section 1.3.1).

The plan for the upcoming water year is released by 30 June each year. The 2015–16 plan, and any variations, are valid for this water year (1 July 2015 to 30 June 2016) or until the subsequent seasonal watering plan is released.

Nature doesn’t keep to strict timelines, so some potential environmental watering scoped in a seasonal watering plan may begin before, or continue beyond, the year of the plan. This means environmental watering actions that start either before July 2015 or continue after June 2016 are still consistent with the plan, especially if there are unforeseen delays in the release of the *Seasonal Watering Plan 2016–17*.

1.2.1 What does ‘seasonal’ mean?

‘Seasonal’ refers to the variability of climatic conditions in a given year. Environmental watering objectives and water availability may differ depending on seasonal conditions, so it is important that environmental water planning considers the range of potential seasonal condition or water availability scenarios that may unfold, ranging from drought to wet (see Figure 1.2.1). This scenario planning provides a guide for the VEWH and waterway managers throughout the year when it comes to deciding what environmental watering to go ahead with.

For each river and wetland system, the potential environmental watering under each water availability scenario is captured in the Scenario planning section of the relevant chapter.

Figure 1.2.1 Examples of environmental watering objectives under different planning scenarios



1.2.2 How does the seasonal watering plan fit in the planning process?

Each year, waterway managers scope the potential environmental watering actions for their regions for the coming year in seasonal watering proposals. The proposals draw on environmental flow studies, and longer term plans such as environmental water management plans and regional waterway strategies.

The proposals incorporate information and advice from local communities.

This seasonal watering plan is a collated summary of the seasonal watering proposals.

The different stages of environmental water planning, including the different strategies and plans, are shown in Figure 1.2.2. More information about each of these strategies and plans can be found at www.vewh.vic.gov.au.

Figure 1.2.2 Victorian environmental watering program planning and management framework



1.2.3 Who contributes to the seasonal watering plan?

Stakeholder engagement on potential environmental watering actions occurs during the development of regional seasonal watering proposals. The level and method of engagement varies across the state, reflecting the differing systems, watering actions and stakeholders. In some regions, formal environmental water advisory groups provide the opportunity for waterway managers and interested community members to discuss potential environmental watering in their system or locality for the coming year. In other systems, engagement occurs one-on-one between waterway managers and interested stakeholders.

Land managers and storage managers also consider and endorse the seasonal watering proposals to ensure that planned watering aligns with land and storage management objectives and can feasibly be delivered through planned system operations.

The engagement activities undertaken by waterway managers during the development of the seasonal watering proposals are summarised in sections 2 to 5 of this plan.

1.2.4 Can the seasonal watering plan be changed?

Under the Victorian *Water Act 1989*, the VEWH can only authorise use of environmental water where it is consistent with a seasonal watering plan. This is to ensure transparency about what environmental watering is planned.

However, to also ensure flexibility to adapt to changing conditions, under the Act the VEWH can vary any section of a seasonal watering plan. This could be to incorporate new knowledge or to address any circumstances not identified before the start of the water year. For example, in 2014–15 the VEWH varied the seasonal watering plan to revise the potential environmental watering in the Campaspe River in light of an updated scientific study of its environmental flow requirements.

All variations are made publicly available at www.vewh.vic.gov.au as separate attachments to the original seasonal watering plan. Printed copies can be requested at general.enquiries@vewh.vic.gov.au.

1.2.5 What kinds of changes don't require a formal variation to the seasonal watering plan?

Changes that do not require a variation to the seasonal watering plan include:

- ▶ minor operational adjustments to specific environmental watering actions
- ▶ environmental water being used for environmental emergency management situations

- ▶ small volumes of environmental water being used for technical investigations
- ▶ facilitating the delivery of water held by other water holders for downstream objectives.

As it is not possible to anticipate the specifics of these demands, it is not possible to include details about them in this plan.

Minor operational adjustments

Minor operational adjustments to environmental watering actions may occur from time to time and do not require a formal variation to the seasonal watering plan. For example, the targeted river reaches, flow rates, timing and durations detailed in sections 2 to 5 may need to be adjusted slightly due to changes in predicted rainfall or other water orders, or delivery infrastructure constraints. In all cases, environmental watering actions will still aim to maximise the environmental outcomes achieved.

Environmental emergency management situations

Environmental water may be needed for an environmental emergency management situation. This may include reducing the impact of natural blackwater or bushfire events, preventing fish deaths or mitigating the effects of blue-green algae blooms. It could also include smoothing the transition to or from a high natural flow event (for example, supplementing natural flows with environmental water to provide a more gradual rise and fall to minimise the threat of river banks slumping).

Small technical investigations

There may be instances where a small volume of environmental water may be used for research and development purposes. Such instances are considered on a case-by-case basis. The project must aim to enhance knowledge and improve environmental water management. It must not compromise the potential to achieve the environmental objectives in the seasonal watering plan.

Facilitating the delivery of water held by other water holders for downstream objectives

Some water held by other water holders is stored in Victorian storages and is sometimes called on to meet downstream demands beyond the scope of this plan (such as for the Coorong, Lower Lakes and Murray Mouth region in South Australia). Delivery of this water is sometimes needed at a time and flow rate that was not scoped in the seasonal watering plan. The VEWH facilitates and authorises such deliveries, provided the risk of adverse impacts on Victoria's rivers, wetlands and floodplains and other risks are appropriately managed.

1.3 Managing available environmental water

Environmental water entitlements are held in 15 water supply systems across Victoria (see Figure 1.3.1). Sections 2 to 5 detail where the water made available under these entitlements may be delivered in 2015–16.

In this section ...

- ▶ **How much water is available to use as part of the Victorian environmental watering program?**
- ▶ **What options are available to effectively and efficiently manage environmental water?**

To the extent possible, the VEWH and other environmental water holders attempt to avoid water supply shortfalls through the efficient use of environmental water, and tools such as carryover and trade. However, if there is still a shortfall of water despite these measures, the VEWH, in collaboration with waterway managers (and other water holders if relevant) must prioritise environmental watering actions.

1.3.1 How much water is available to use as part of the Victorian environmental watering program?

VEWH environmental entitlements

Environmental water is made available under the environmental water entitlements held by the VEWH which are known as Water Holdings. Table 1.3.1 details the entitlements held by the VEWH as at 30 June 2015, including those held in trust for the Living Murray program. The VEWH's environmental water entitlements can be viewed at <http://waterregister.vic.gov.au/water-entitlements/bulk-entitlements>.

The water available to use under these entitlements varies from year to year, depending on entitlement rules, seasonal conditions (including rainfall and runoff in the catchments) and the water already available in storages.



West Barwon River, by Saul Vermeeren

Table 1.3.1 Environmental water entitlements held by the VEWH (as at 30 June 2015)¹

System	Entitlement	Volume (ML)	Class of entitlement
Gippsland Region			
Latrobe	Latrobe River Environmental Entitlement 2011	n/a ²	Unregulated
	Blue Rock Environmental Entitlement 2013	18,737 ³	Share of inflow
Thomson	Bulk Entitlement (Thomson River – Environment) Order 2005 ⁴	10,000	High
Macalister	Macalister River Environmental Entitlement 2010	12,461	High
		6,230	Low
Central Region			
Yarra	Yarra Environmental Entitlement 2006 ⁴	17,000	High
		55	Unregulated
Tarago	Tarago and Bunyip Rivers Environmental Entitlement 2009	3,000 ³	Share of inflow
Werribee	Werribee River Environmental Entitlement 2011	n/a ³	Share of inflow
Moorabool	Moorabool River Environmental Entitlement 2010 ⁴	7,086 ³	Share of inflow
Barwon	Barwon River Environmental Entitlement 2011	n/a ²	Unregulated
Western Region			
Wimmera and Glenelg	Wimmera and Glenelg Rivers Environmental Entitlement 2010 ^{4,5}	40,560	Pipeline product
		1,000	Wetland product
Northern Region			
Murray	Bulk Entitlement (River Murray – Flora and Fauna) Conversion Order 1999	29,782	High
		3,894	Low
		40,000	Unregulated
	Bulk Entitlement (River Murray – Flora and Fauna) Conversion Order 1999 – Barmah-Millewa Forest Environmental Water Allocation	50,000	High
		25,000	Low
	Bulk Entitlement (River Murray – Flora and Fauna) Conversion Order 1999 – Living Murray	9,589	High
	101,850	Low	
	34,300	Unregulated	
	Environmental Entitlement (River Murray – NVIRP Stage 1) 2012	21,965 ⁶	High
	Bulk Entitlement (River Murray – Snowy Environmental Reserve) Conversion Order 2004	29,794	High
	Water shares – Snowy Environmental Reserve	14,671	High
		6,423	Low
Goulburn	Goulburn River Environmental Entitlement 2010	8,851	High
		3,140	Low
	Environmental Entitlement (Goulburn System – Living Murray) 2007	39,625	High
		156,980	Low
	Environmental Entitlement (Goulburn System – NVIRP Stage 1) 2012	31,679 ⁶	High
	Bulk Entitlement (Goulburn System – Snowy Environmental Reserve) Order 2004	30,252	High
8,156		Low	
	Water Shares – Snowy River Environmental Reserve	8,321	High
		17,852	Low
	Silver and Wallaby Creeks Environmental Entitlement 2006 ⁴	0	Passing flow only
Campaspe	Environmental Entitlement (Campaspe River – Living Murray Initiative) 2007	126	High
		5,048	Low
	Campaspe River Environmental Entitlement 2013	20,652	High
		2,966	Low
Loddon	Bulk Entitlement (Loddon River – Environmental Reserve) Order 2005 ⁵	8,270	High
		2,024	Low
	Environmental Entitlement (Birch Creek – Bullarook System) 2009 ^{4,5}	100	n/a ⁷
	Water Shares – Snowy River Environmental Reserve	470	High

¹ While the VEWH does not hold any entitlements in the Maribyrnong system, water allocation was purchased in this system (together with Melbourne Water) in 2013–14 and 2014–15.

² Use of these entitlements is dependent upon suitable river heights, as specified in both the Latrobe and Barwon environmental entitlements.

³ Water is accumulated continuously according to a share of inflows (Blue Rock 9%, Tarago system 10.3%, Werribee system 10%, Moorabool system 11.9%) and this volume represents the maximum that can be stored at any time. The actual volume available in any year varies according to inflows.

⁴ In addition to volumetric entitlement, the entitlement also includes passing flows.





⁵ In addition to volumetric entitlement, the entitlement also includes unregulated water.

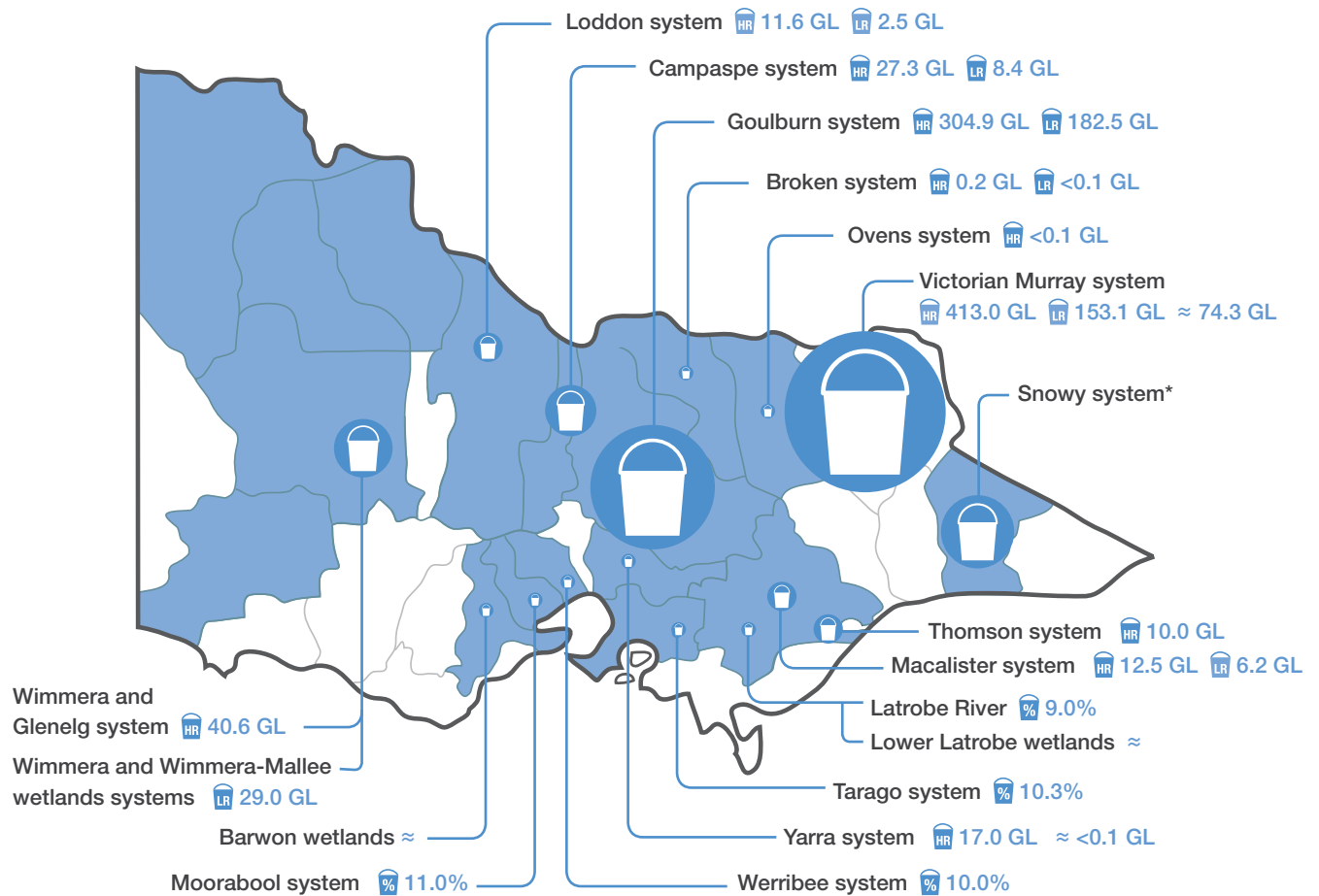
⁶ This entitlement volume is equal to one-third of the total water savings from GMW Connections Project Stage 1, as verified in the latest audit (including mitigation water).

⁷ Allocation against this entitlement is made subject to specific triggers, as specified in the entitlement.

Figure 1.3.1 The sum of environmental water entitlements held in Victoria (including by the Victorian Environmental Water Holder, the Commonwealth Environmental Water Holder and the Murray-Darling Basin Authority under the Living Murray program) as at 30 June 2015

Key

-  High-reliability
-  Low-reliability
-  % share of inflows
-  Unregulated



*See page 36 for further information about water available for environmental flows in the Snowy system.

Water donations

The VEWH may receive water donations from individuals, community groups and other organisations. This water could be used for environmental watering in the water year it was donated (including for actions identified in the seasonal watering plan), or it could be carried over for use in the future (see section 1.3.2 for more information on carryover). Some donors may identify a specific use for the water they donate (such as environmental watering in a specific wetland or using environmental water to protect a certain tree species). The costs and benefits of each donor proposal is considered by the VEWH. These donations may be authorised by the VEWH if considered environmentally beneficial.

Water available from other environmental water holders

In northern and western Victoria, the VEWH coordinates with other environmental water holders to deliver environmental outcomes at the broader Murray-Darling Basin scale. One of the VEWH's important roles is to coordinate with Murray-Darling Basin environmental water holders (the CEWH, MDBA and environmental water managers in New South Wales and South Australia) to maximise the benefits of all environmental water delivery in Victorian waterways. The seasonal watering plan considers the use of all water holders' water held in Victorian river systems.

In most cases, when Commonwealth or Living Murray water is to be delivered in Victoria, the CEWH and MDBA transfer the agreed amount of water to the VEWH. That amount then becomes part of the Victorian Water Holdings until used or transferred back.

Table 1.3.2 shows the environmental entitlements held by the CEWH and MDBA in Victoria. The CEWH and MDBA also hold water in New South Wales and South Australia, which could potentially be made available for environmental watering in Victoria.

Table 1.3.2 Environmental water entitlements held in Victoria by other water holders at 30 April 2015

System	Volume (ML)	Class of entitlement
Living Murray entitlements (held by MDBA)		
Murray	12,267	High-reliability water share
Goulburn	5,559	High-reliability water share
Commonwealth Environmental Water Holdings		
Ovens	70	High-reliability water share
Murray	293,492 20,117	High-reliability water share Low-reliability water share
Broken	157 4	High-reliability water share Low-reliability water share
Goulburn	250,846 22,379	High-reliability water share Low-reliability water share
Campaspe	6,547 395	High-reliability water share Low-reliability water share
Loddon	3,356 527	High-reliability water share Low-reliability water share
Wimmera-Mallee	28,000	Low-reliability water share

1.3.2 What options are available to effectively and efficiently manage environmental water?

Other water sources

Environmental water is not the only type of water that can support river, wetland and floodplain health. Waterway managers and environmental water holders, in consultation with storage managers, consider the potential for environmental watering objectives to be met by other types of water. Timing environmental releases can also be combined with other types of water to achieve greater benefits than an environmental release alone could produce.

System operating water (including passing flows) maintains a baseflow in many rivers to which environmental water can be added.

Heavy rainfall (resulting in unregulated flows) can naturally meet an environmental objective, so water available under environmental water entitlements is not needed.

The timing and route for delivery of consumptive water can sometimes be altered to achieve environmental objectives without impacting consumptive water users.

These types of water are considered in the development and implementation of the seasonal watering plan to ensure effective system operations and efficient use of environmental water, and to achieve the maximum benefit to the environment.

Return flows

In some systems, environmental water delivered through upstream sites can be used again downstream. This helps to ensure environmental water is used efficiently and effectively to achieve optimal environmental benefits, as the Goulburn River example below illustrates.

This reuse policy, known as return flows, is available in many systems across northern Victoria. It increases the efficiency of environmental water use and helps reduce the volume of water needed to be recovered for the environment from consumptive water users.

The VEWH's access to return flows is enabled through rules in its environmental entitlements. Reuse of return flows is also available to the CEWH and MDBA when the VEWH delivers water on their behalf.

Where possible, return flows are reused to provide benefits at Victorian environmental sites. If not needed in Victoria, VEWH, Living Murray and CEWH return flows will continue to flow across the border to South Australia, where they will be used to provide environmental benefits at sites such as the Coorong, Lower Lakes and Murray Mouth region.

Reusing return flows

Environmental water is delivered in the Goulburn River to provide environmental benefits such as stimulating fish to breed and promoting the growth of vegetation on river banks. The water flows down the Goulburn River and into the River Murray. The VEWH can apply to the storage manager (Goulburn-Murray Water) to have the volume of environmental water that reached the River Murray re-credited in its accounts as a return flow. This water can then be reused at a priority environmental site in Victoria (such as at Hattah Lakes near Mildura) or used for River Murray environmental outcomes in South Australia. If the water is to be reused in South Australia, the VEWH trades the re-credited return flow volume to environmental water holders in South Australia.

Carryover

Some entitlements allow the VEWH to carry over unused water to the following water year. This means that water allocated in one year can be kept in storages for use in the following year, subject to certain conditions.

Carryover provides flexibility and enables environmental water to be delivered at a time that is of the greatest value to the environment. For example, carryover can help ensure environmental water holders can meet high winter and spring demands when there is a risk there will be little water available under entitlements at the beginning of the water year.

Water trade

Water trading allows the VEWH to move water to the systems where it is most needed, and to smooth out some of the variability in water availability across systems and across years. The VEWH can trade water allocated to its entitlements by:

- ▶ administrative water transfers between VEWH entitlements
- ▶ administrative water transfers with other environmental water holders
- ▶ purchasing water allocation
- ▶ selling water allocation.

Administrative water transfers are the most common trades the VEWH undertakes. These occur between VEWH entitlements (or accounts) to move water to where it is most needed. Other environmental water holders also transfer their water to the VEWH for delivery in Victoria. These types of water trades are often referred to as administrative transfers as there is no financial consideration associated with the trade.

The VEWH can also buy or sell water allocation where it is in line with the VEWH's statutory objectives: that is, if it benefits the environment. The VEWH has bought or sold a small amount of water allocation each year since it was established in 2011.

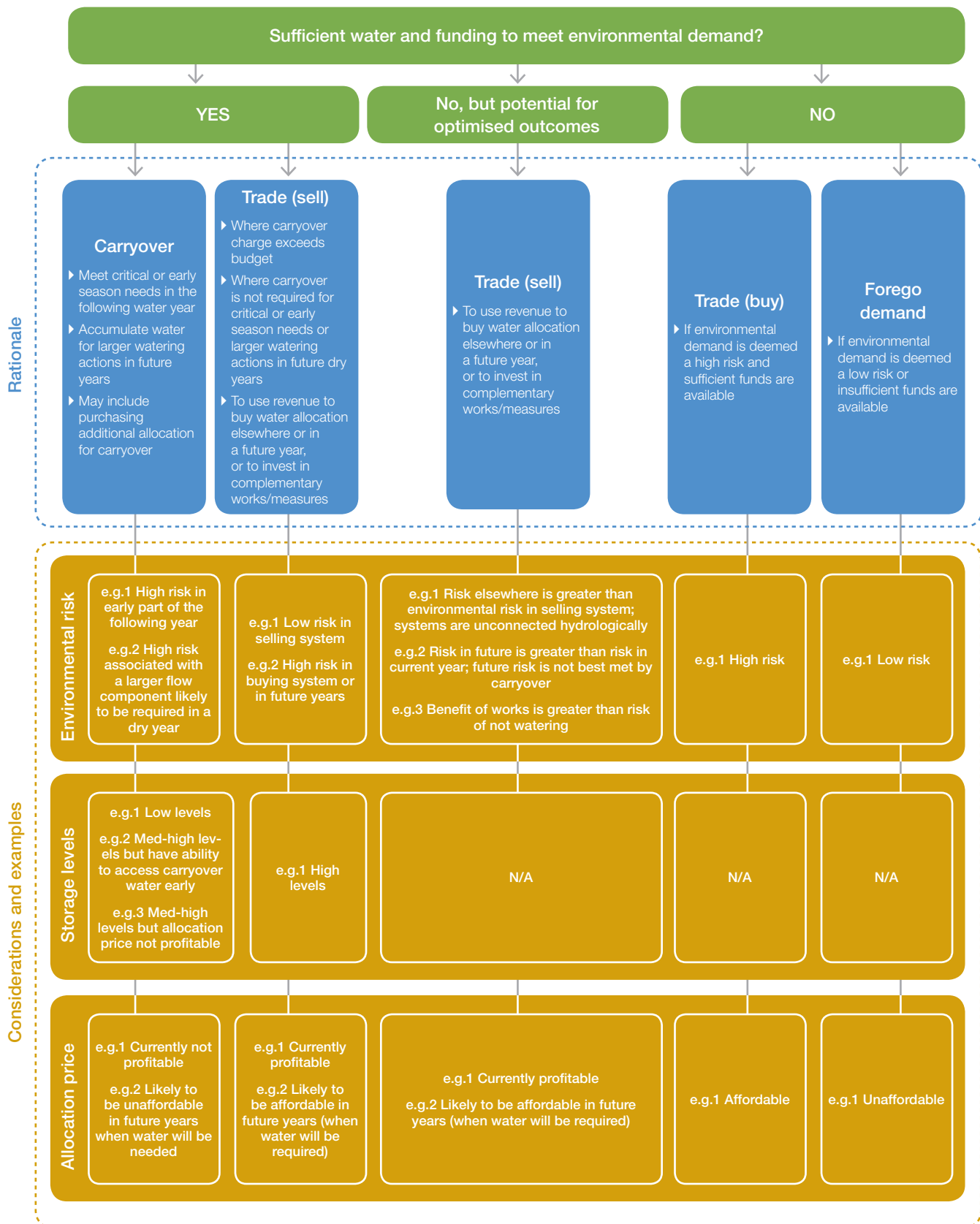
Water has been purchased to enhance environmental outcomes in systems where insufficient environmental water was available, and it has been sold where all foreseeable environmental demands were able to be met. Revenue raised by selling water allocation can be used to purchase water to meet shortfalls in any Victorian system, or to invest in measures (such as monitoring, technical or small structural works, or other improvements to the performance of Victoria's environmental watering program).

Subject to the approval of the Minister for Environment, Climate Change and Water, the VEWH can also trade its water entitlements, referred to as a permanent trade. However, permanent trades are infrequent.

The VEWH has developed a decision tree (Figure 1.3.2) that shows key considerations guiding carryover and trade decisions.

More information about the VEWH's trading activity, including its annual trading strategy for northern Victoria, can be found on the VEWH website at www.vevh.vic.gov.au.

Figure 1.3.2 Key considerations in carryover and trade decisions



1.4 Implementing the seasonal watering plan

The seasonal watering plan scopes potential environmental watering for the coming year, but many factors influence decisions about what environmental water is actually committed and delivered.

These include:

- ▶ seasonal conditions, weather forecasts and catchment conditions
- ▶ river and system operations (such as unregulated flows, catchment inflows, storage levels, other water users' needs and potential delivery constraints)
- ▶ ecological or biological factors and triggers (such as plant and animal responses to natural flows or temperature)
- ▶ water availability
- ▶ risks associated with an environmental watering action (such as deteriorating water quality).

It is important that there is flexibility to respond to these different factors, as they can significantly influence the environmental outcomes that can be achieved.

In this section ...

- ▶ **How do program partners decide which watering actions are delivered?**
- ▶ **When does the VEWH commit and authorise its water for use?**
- ▶ **How are recreational, Indigenous cultural and economic benefits considered in environmental watering?**
- ▶ **How are risks managed?**
- ▶ **What if there is not enough environmental water available?**

1.4.1 How do program partners decide which watering actions are delivered?

As the season unfolds, many of the uncertainties associated with seasonal conditions, water availability and operational context become clearer, and inform decisions about what environmental watering should proceed. Many on-ground factors do not become clear until very close to the anticipated time of water delivery.

Waterway managers, environmental water holders, storage managers and land managers all play a role in deciding which watering actions are or can be delivered during the year. These decisions are often taken collaboratively, as each program partner has a role in approving the delivery of environmental water.

For example, waterway managers are best placed to determine the local environmental requirements and risks of a watering action. Storage managers know the delivery feasibility and operational risks, as they are responsible for delivering water to all entitlement holders. Land managers know the risks and feasibility of watering their land. Environmental water holders advise on the availability of environmental water, and must understand how much water is needed when to inform water commitment decisions.

If decisions are required as a result of unforeseen or consequential changes to planned watering during the season, further scientific or community input may be sought to inform decision makers.

Regularly updated information about current and anticipated environmental watering actions is published on the VEWH website at www.vewh.vic.gov.au.

1.4.2 When does the VEWH commit and authorise its water for use?

The VEWH, like other environmental water holders, can commit its water at any point before or during the water year. The VEWH commits water via seasonal watering statements which authorise waterway managers to use environmental water. Seasonal watering statements are published on the VEWH website at www.vewh.vic.gov.au.

A seasonal watering statement can be made at any time of the year. Depending on the nature of the system and the entitlement being used, there may be one or multiple statements made for a particular system. Before issuing a seasonal watering statement, the VEWH must be sure that the required delivery arrangements (including any risk management measures) are in place, and that any costs to be met by the VEWH are acceptable.

The VEWH aims to commit as much water as possible, as early as possible, to provide waterway managers with as much certainty as possible to enable them to proceed with the planned environmental watering actions.

Where many environmental watering actions planned across different systems require access to the same environmental water entitlement, decisions to commit water to particular actions may require more thorough consideration. This may require one river or wetland to be prioritised over another. See section 1.4.5 for further information about how prioritisation decisions are made.

In some instances, VEWH may commit water very close to the anticipated delivery time. This may be necessary because the water demand arises at short notice due to environmental, operational or weather conditions triggering

the need for environmental water. For example, if colonial waterbirds start nesting in Barmah Forest, this may trigger a need for environmental water to maintain shallow flooding long enough for the birds to breed and fledge.

There may also be instances where no environmental water is committed to a particular site. This could be due to many factors, such as an ecological trigger or seasonal conditions that indicate watering should not proceed, or because there is insufficient water to achieve the planned watering action.

The CEWH and MDBA (through the Living Murray program) commit water for use in Victoria with similar logic to that outlined above. The VEWH then formally authorises the use of that water through seasonal watering statements.

Can environmental water holders change their minds after a seasonal watering statement has been issued?

The VEWH may withdraw a seasonal watering statement at any point in the year. Such an action is undertaken in consultation with the relevant waterway manager and storage manager for that river or wetland system. This may occur due to factors such as emerging risks or changes in operating conditions or water availability.

Similarly, a waterway manager or storage manager may decide, in consultation with the VEWH, not to proceed with an environmental watering action after a seasonal watering statement has been issued. This could occur as a result of environmental triggers indicating the water was no longer required, resourcing constraints or new information that the potential environmental or public risk of watering was too high.



Werribee River, by Erin Ashcroft

1.4.3 How are recreational, Indigenous cultural and economic benefits considered in environmental watering?

In planning for environmental watering, the primary purpose is to maximise environmental benefit. However, where consistent with this purpose, program partners also consider whether other benefits can be achieved.

Environmental watering provides a range of shared benefits including recreational, Indigenous cultural and economic benefits. By improving the health of rivers, wetlands and floodplains, environmental watering increases opportunities for recreational pursuits (such as fishing, water skiing and bushwalking). Similarly, environmental watering helps to sustain healthy Country for Indigenous communities that have a continuing connection to the land and waterways. Environmental watering also improves water quality which can have indirect economic benefits for irrigation.

When planning for and delivering environmental water, the VEWH and program partners look for opportunities to achieve these shared benefits, where environmental outcomes are not compromised.

Waterway managers work with communities to identify the environmental, social, Indigenous cultural and economic values of waterways through regional waterway strategies, environmental water management plans and seasonal watering proposals. A summary of these values in each system is identified in sections 2 to 5. Program partners will continue to work with stakeholders to look for opportunities to achieve shared benefits from environmental watering.

1.4.4 How are risks managed?

Risk management is an integral part of environmental watering, and is considered by program partners throughout environmental water management (that is, during long-term and annual planning, implementation and review).

The seasonal watering proposals, on which this *Seasonal Watering Plan 2015–16* is based, identify potential risks associated with the specific watering actions proposed for the coming water year. They include an assessment of risks and identify mitigating actions. Often, the management of risks associated with environmental watering is shared between program partners as it requires a collaborative risk management approach.

Table 1.4.1 shows the main shared risks of environmental watering. Program partners consider and reassess these and other potential risks as the season unfolds and planned watering actions are due to commence.



Canoeing on the Thomson River, by Jake Marler

Table 1.4.1 Main shared risks of environmental watering

Type of risk	Example mitigating actions
Environmental watering contributes to third-party impacts	<ul style="list-style-type: none"> ▶ Identify and understand water system capacities and monitor water levels at critical locations to inform daily water release decisions and ensure impacts do not eventuate. ▶ Consider potential catchment runoff from forecast rainfall before deciding on timing of environmental water releases. ▶ Implement a communication strategy including media releases, public notices and signage before environmental watering, to ensure people are informed of significant environmental water deliveries and can adjust their behaviour as necessary. This includes early liaison with potentially affected stakeholders. ▶ Restrict access through gate and track closures.
Inability to achieve or demonstrate ecological outcomes from environmental watering	<ul style="list-style-type: none"> ▶ Undertake intervention monitoring within available resources to capture ecological response. ▶ Conduct research to better understand environmental watering responses. ▶ Communicate outcomes of monitoring and incorporate learnings into future environmental watering.
Environmental watering has negative effects on the environment (e.g. blackwater, bank erosion, spread of weeds)	<ul style="list-style-type: none"> ▶ Monitor outcomes of environmental watering and reassess future deliveries and/or scientific recommendations if necessary. ▶ Plan the timing, frequency, duration and variability of environmental watering to limit conditions that are favourable to non-native plants and animals or which have negative effects.

Some risks may only eventuate at the time of delivery. For example, if there is significant rain forecast, there is a risk that this could cause nuisance flooding if combined with a scheduled environmental watering action. To avoid this, risks are always reconsidered by program partners within the specific environmental and operational contexts of a watering action to inform decisions about whether delivery should proceed. Any measures or actions required to mitigate the risks identified are implemented as agreed by the responsible program partner. Watering actions will not be implemented if an unacceptable risk to the public or the environment is identified.

Even with best practice risk management controls in place, there may be unintended impacts from environmental watering or situations where environmental watering cannot occur as planned. In these situations, it is imperative that partners work together to respond to risks, and then learn and adapt their management of risks. An agreed approach to incident management has been developed to help program partners report, investigate and respond to risks.

1.4.5 What if there is not enough environmental water available?

In any given year, the need for environmental water as outlined in the seasonal watering plan can be higher than the water available to use, so it is important to consider where water is most needed and how it can be used most efficiently to achieve the best environmental outcomes.

A shortfall in supply might arise because of:

- ▶ significant, high-value environmental water demands
- ▶ drought or low water availability.

If there is still a shortfall of water, the VEW, in collaboration with waterway managers and other water holders if relevant, must prioritise environmental watering actions.

What are some examples of prioritisation decisions program partners may have to make?

When the demand for environmental water is higher than the available supply, program partners may need to make watering trade-offs between:

- ▶ different environmental watering actions within one river or wetland (see example 1)
- ▶ different river reaches or wetlands in one river system (that is, deciding to commit water to one river reach or wetland over another in the same system) (see example 2)
- ▶ different regions (that is, deciding to commit water to a river or wetland in one region over a river or wetland in another region) (see example 3).

The timing of environmental watering may also affect such decisions. There may need to be trade-offs between earlier or later actions within the current year, or trade-offs between water years (such as forgoing some environmental watering in the current year to ensure a higher-priority watering can be achieved in the following year) (see example 4).

Prioritisation decisions are influenced by many factors such as the previous watering history in that river or wetland, environmental or public risk considerations, or seasonal conditions in that region. They can be extremely difficult, and often involve trading off the potential risks of particular watering actions.

In making the decision to prioritise one environmental watering action and site over another, the VEW always seeks to maximise environmental outcomes across the state.

Example 1: Prioritising between actions within one river or wetland

Environmental water needs in the Goulburn River can be higher than the anticipated water available to use. Such circumstances require program partners to prioritise which environmental watering actions are most critical in a given water year, based on factors such as ecological or climate conditions at the time. A spring fresh might be prioritised over a winter fresh in a particular year because it is more important to encourage fish to spawn that year than to provide winter flows for water bug habitat, or because climate forecasts indicate there is more likelihood that the winter flow will occur naturally. However, in another year, the priority may change because spawning occurred the year before and does not need to occur every year, and dry conditions mean the winter flow is unlikely to occur naturally.

Example 2: Prioritising between river reaches or wetlands within the same system

A significant number of wetlands, creeks and floodplains across northern Victoria can be supplied by environmental water held in the Murray system. However, during the Millennium Drought, environmental water availability was extremely low. As there was not enough water to deliver to every site, program partners worked together to decide on the most effective use of the water and how it would be delivered. Murray environmental water was prioritised for delivery to selected wetlands and floodplains to avoid critical loss of species and to protect refuge areas. This included delivery to the wetland sites that supported the critically endangered Murray hardyhead fish and to localised sections of floodplains to provide key drought refuge for animals and prevent the irreversible loss of river red gums.

Example 3: Prioritising between rivers or wetlands in different regions

For consecutive years there was not enough environmental water to provide spring freshes in the Thomson River to encourage the migration of juvenile Australian grayling. In 2014, the VEWI decided to transfer just under 4,000 ML of environmental water from the Yarra system to the Thomson system to ensure the priority environmental watering action could be delivered.

Australian grayling spawn in downstream reaches of coastal river systems and the juvenile fish then spend time in the sea before migrating back upstream. Flows of specific duration and magnitude are required to trigger both spawning and returning migrations. In recent years, there have been regular spawning opportunities provided for Australian grayling in the Thomson River, and monitoring showed that successful spawning and recruitment of Australian grayling had occurred. However, flows that trigger the return of juvenile grayling to the upstream reaches had been absent since 2010–11.

Unused environmental water had been carried over in the Yarra system from previous years, and there was sufficient water remaining to provide the planned environmental watering in the Yarra system that year. A risk assessment determined that the transfer posed a low risk to achieving environmental outcomes in the Yarra system, while it would provide added benefits in the Thomson system.

This transfer is an example of how water may be prioritised across different regions. It also shows how use, trade and carryover decisions can maximise the value of available water across the state to achieve environmental outcomes.

Example 4: Prioritising between watering actions this year and next year

Inflows to waterways and storages in the Western Region were extremely low in 2014–15. There was a significant risk that conditions would remain very dry leading into 2015–16, with a high likelihood of low water availability. As a result, program partners decided to reduce, and in some waterways temporarily cease, environmental watering in the Wimmera and Glenelg systems in the last quarter of 2014–15 to carry over water for higher-priority watering in 2015–16. Although there were environmental risks associated with ceasing deliveries, trialling such an action during the cooler autumn months (when water quality risks are lower) was preferable to potentially not being able to provide flows during the hotter months of 2015–16 when risks to native fish and other animals from poor water quality will be much more significant. Carrying over this water may prove critical for ensuring environmental watering can occur during summer and autumn 2015–16 to help protect native fish and other animals that rely on the rivers and creeks in the Wimmera and Glenelg systems.

What criteria are used to guide prioritisation decisions?

The criteria below are considered when making the above trade-off decisions and prioritising the range of potential environmental watering actions.

- ▶ Extent and significance of the environmental benefit expected from the watering action: for example, the area watered, the size of the breeding event to be triggered and the conservation status of the species that will benefit.
- ▶ Certainty of achieving the environmental benefit from the watering action and ability to manage other threats: for example, a flow has been provided in the past with demonstrated benefits and relevant complementary measures are being undertaken at the site.
- ▶ Ability to provide ongoing benefits at the site at which the watering action is to take place: for example, where the management arrangements provide for watering in the long term.
- ▶ Watering history at the site and the implications of not undertaking the potential watering action at the site: for example, the potential for critical or irreversible loss of important environmental values.
- ▶ Feasibility of the watering action: for example, the flexibility of timing of the delivery, operational requirements and constraints, and infrastructure capacity.
- ▶ Overall cost-effectiveness of the watering action: for example, considering the likely benefit to be achieved against the cost of the watering action (including the volume of water to be used and any delivery and risk management costs).

How are recreational, Indigenous cultural and economic considerations included in the prioritisation process?

Environmental benefits are the key consideration in the watering prioritisation process. However, opportunities are sought to achieve shared recreational, Indigenous cultural and economic benefits, provided environmental outcomes are not compromised. The VEWB and waterway managers are interested in seeking and developing robust methods to better incorporate these values in the watering prioritisation process.

Who is involved in the prioritisation process?

Waterway managers, environmental water holders, storage managers and communities all have a role in prioritising environmental watering actions, depending on the nature and scale of the decision being made.

During the season, prioritisation decisions are typically made by waterway managers and environmental water holders in consultation with other program partners. Assessments of the risks and benefits of different prioritisation decisions are collaborative because each program partner is involved in delivering the environmental water. These decisions are also informed by long-term environmental watering objectives and priorities which have been identified in consultation with local communities.

Waterway managers are best placed to advise about the extent and significance of an environmental watering action and the highest priorities in their region.

VEWH and other environmental water holders determine the highest watering priorities across regions and have a mandate to commit environmental water to particular watering actions and sites over others. VEWB's decisions are intended to provide the best possible environmental outcomes for the state. The VEWB makes these decisions in consultation with waterway managers as the primary environmental watering representatives of their regions, and with other program partners as relevant.

Advice from storage managers is generally the key to understanding the feasibility of delivering a watering action, including the flexibility of delivery timing, or operational constraints.

Land managers provide consent to environmental water delivery on their land and will advise on delivery feasibility in light of land management activities, public access and the risks and benefits of the environmental watering action.

The annual prioritisation process is informed by longer-term site prioritisation by waterway managers in consultation with their communities. This prioritisation is in plans such as regional waterway strategies and environmental water management plans. These plans draw on community and scientific knowledge and prioritise sites for environmental watering (and other river health activities) that have high environmental, cultural, social and economic value to the community.

Additional input from the community on prioritisation of environmental watering is provided annually where needed.



Upper Gunbower Forest, by Anna Chatfield