

Overview of the Basin-wide environmental watering strategy

The Basin-wide environmental watering strategy (the [Strategy](#)) is the long-term watering plan for the Basin. It sets out the improvements that we expect to see for river flows and connectivity, native vegetation, waterbirds and native fish with the water being recovered for the Basin environment, and other measures to improve flows in the river system.

The Strategy was first published in 2014. We have reviewed and updated it to reflect policy changes including the northern Basin review, new scientific knowledge and other updates in the intervening years, as well as new information about the condition of some of the Basin's water-dependent ecosystems. We've added a clear objective to 'maximise environmental outcomes through effective and efficient environmental water management' and greater consideration of 'all water' in achieving environmental outcomes. The updated Strategy reinforces the need to relax constraints and solve issues with water delivery to achieve the Basin Plan's objectives. It also identifies work for the next update.

Restoring the Basin environment

The Murray–Darling Basin includes thousands of kilometres of rivers, more than 30,000 wetlands and many species of plants and animals that depend on a variety of river flows and periodic wetland and floodplain inundation for their survival. Several of the Basin's wetlands are of international importance for migratory waterbirds.

Many of the Basin's rivers and wetlands have been modified to provide water for towns, industries and to grow food. In some rivers, up to half of the water that would have naturally flowed down them is removed for human use, which has contributed to a decline in their health.

To ensure a sustainable future for the Murray–Darling Basin, we need to carefully balance the needs of people and the environment. The Basin Plan aims to ensure that the Basin's rivers, wetlands and floodplains are healthy and more resilient in the face of drought and climate change, and therefore able to support strong communities, productive industries and the interests of First Nations people.

The Basin Plan sets sustainable diversion limits for how much water can be taken from the Murray–Darling river system for towns, farms and other consumptive uses. Water left in the river system, including water recovered for the environment by the Australian Government, is available to restore and protect rivers, wetlands and floodplains (water-dependent ecosystems).

Water for the environment maintains and improves the health of the Basin's river systems including plant communities, native animals, water quality and ecosystems. Healthy rivers support the cultural needs of First Nations people, the needs of Basin communities and economic activities including agriculture.

About the Strategy

Implementing the Basin Plan is a shared responsibility. The Plan includes an Environmental Watering Plan, which sets out the arrangements to be followed by the Murray–Darling Basin Authority (MDBA), Commonwealth Environmental Water Holder (CEWH) and Basin States to meet the Plan’s environmental objectives. The Strategy is a key element of the Environmental Watering Plan.

The Strategy supports environmental water holders, Basin state governments, water managers and river operators to plan and manage environmental watering at a Basin scale and over the long term, to achieve the environmental objectives of the Basin Plan.

The Strategy is one element in the planning process—other important parts include long-term environmental watering plans and water resource plans (to be developed consistently with the Strategy) which Basin states prepare and implement for each region or catchment.

The Strategy:

- guides the planning and delivery of water for the environment at the Basin scale over the long term
- clearly expresses the expected environmental outcomes, as quantitatively as possible, to be achieved by environmental water management at Basin scale
- maximises environmental outcomes through effective and efficient environmental water management and consideration of all water
- explains the context within which Basin annual environmental watering priorities will be set, and
- guides the development of consistent and complementary long-term environmental watering plans.

Expected environmental outcomes

Expected environmental outcomes are an important step in the ongoing improvement of water management as they reflect our current understanding of environmental water requirements and, through monitoring and evaluation, help identify opportunities for improvement. The Strategy identifies four themes and quantified expected environmental outcomes for them. The themes are flows and connectivity, native vegetation, waterbirds and native fish. These themes are a subset of the components of a water-dependent ecosystem and are reflected in the objectives and targets of the Basin Plan. Additional themes may be included in the 2022 Strategy update.

The table below summarises the quantified expected environmental outcomes that the MDBA estimates can be achieved using all water in the Murray–Darling river system. These expected outcomes are unchanged from 2014 and:

- are developed to be as SMART (Specific, Measurable, Achievable, Relevant, and Time-bound) as practicable to provide a clear quantified picture of the achievement of key ecological Basin Plan objectives



- add detail to the qualitative descriptions of key ecological objectives in the Basin Plan
- support the evaluation of the Basin Plan’s effectiveness
- enable a rigorous assessment of whether objectives are being achieved.

A full list of expected environmental outcomes can be found in the Strategy.



Figure 1: Little Reedy Lagoon in Gunbower Forest receiving a small top-up during July 2019 (Photo courtesy of Genevieve Smith, North Central Catchment Management Authority).

Achieving environmental outcomes

The way water is stored and extracted for consumptive use has changed the pattern of river flows and of floodplain and wetland watering systems. These changes may include decreased frequency, magnitude or duration of flows (e.g. small to medium overbank flows in most systems). River regulation also affects the timing of flows resulting in higher summer flows and lower winter-spring flows than would occur naturally.

Generally, changes to flows have affected the connectivity of rivers along their length, out to the adjoining floodplain and to groundwater. These changes have affected the health, abundance and range of many water-dependent native species.

Water for the environmental aims to restore ecologically significant parts of the flow regime to a more natural pattern. This is achieved by adding recovered water to existing flows, and by releasing the portion of recovered water stored in dams at the right time and volume to support ecological processes.

The improvements in flow and connectivity from these actions are expected to enhance environmental outcomes for native vegetation, waterbirds, native fish, other water-dependent plants and animals and ecosystem functions across the Basin. Improvements in flows and connectivity in the Basin, and local management, will improve the connection of the river to its estuary (the Coorong) and to the sea.

Improvements in flow and connectivity also are expected to contribute towards achieving the Basin Plan objective to ensure adequate flushing of salt from the River Murray system into the Southern Ocean.

Table 1: Summary of quantified environmental expected outcomes that can be achieved beyond 2019

River flows and connectivity	Vegetation	Waterbirds	Fish
<p>Improve connections along rivers and between rivers and their floodplains</p> <p>Maintained base flows:</p> <ul style="list-style-type: none"> at least 60% of natural levels <p>Improved overall flow:</p> <ul style="list-style-type: none"> 10% more into the Barwon–Darling¹ 30% more into the River Murray² 30–40% more to the Murray mouth (and it open to the sea 90% of the time) <p>Maintained connectivity in areas where it is relatively unaffected:</p> <ul style="list-style-type: none"> between rivers and floodplains in the Paroo, Moonie, Nebine, Warrego and Ovens <p>Improved connectivity with bank-full and/or low floodplain flows:</p> <ul style="list-style-type: none"> by 30–60% in the Murray, Murrumbidgee, Goulburn and Condamine–Balonne by 10–20% in remaining catchments³ <p>Maintain the Lower Lakes above sea level</p>	<p>Maintain the extent and improve the condition</p> <p>Maintenance of the current extent of:</p> <ul style="list-style-type: none"> 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 <p>Maintain the current condition of lowland floodplain forests and woodlands of:</p> <ul style="list-style-type: none"> river red gum black box coolibah <p>Improved condition of:</p> <ul style="list-style-type: none"> southern river red gum 	<p>Maintain current species diversity, improve breeding success and numbers</p> <p>Maintained current species diversity of:</p> <ul style="list-style-type: none"> all current Basin waterbirds current migratory shorebirds at the Coorong <p>Increased abundance:</p> <ul style="list-style-type: none"> 20–25% increase in waterbirds by 2024 <p>Improved breeding:</p> <ul style="list-style-type: none"> up to 50% more breeding events for colonial nesting waterbird species a 30–40% increase in nests and broods for other waterbirds 	<p>Maintain current species diversity, extend distributions, improve breeding success and numbers</p> <p>Improved distribution:</p> <ul style="list-style-type: none"> of key short and long-lived fish species across the Basin <p>Improved breeding success for:</p> <ul style="list-style-type: none"> short-lived species (every 1–2 years) long-lived species in at least 8/10 years at 80% of key sites mulloway in at least 5/10 years <p>Improved populations of:</p> <ul style="list-style-type: none"> 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% more mature fish at key sites) <p>Improved movement:</p> <ul style="list-style-type: none"> more native fish using fish passages

¹ Comprising tributary contributions from: Condamine–Balonne, Border Rivers, Gwydir, Namoi and Macquarie–Castlereagh catchments

² Comprising tributary contributions from: Murrumbidgee, Goulburn–Broken, Campaspe, Loddon and Lower Darling catchments

³ Border Rivers, Gwydir, Namoi, Macquarie–Castlereagh, Barwon–Darling, Lachlan, Campaspe, Loddon and Wimmera catchments

Water management strategies

Water managers and river operators use a range of approaches to provide water for the environment. Sometimes, water is delivered from dams and weirs. It might be used to top up natural flows following on from rain to boost the benefits for the environment. Sometimes, the best way to achieve improvements is to protect water already in the river system.

Environmental watering has been undertaken in the Basin for decades—the earliest actions occurred in 1980 in the Macquarie Marshes. Over this time much has been learned about how to manage environmental water effectively. The strategies and management approaches that have emerged from this experience should continue to be applied across the Basin, namely:

- harness local community land and water knowledge
- contribute to environmental benefit when managing all water
- manage water in harmony with natural biological processes
- collaborate on the planning and management of environmental watering to target multiple environmental assets and ecosystems functions
- manage risks associated with the delivery of environmental water, and
- apply adaptive management in the planning, prioritisation and use of environmental water.

In addition to these overarching strategies, we have identified strategies for the four ecological themes which recognise the particular needs of these components of the Basin’s water-dependent ecosystems.

The strategies will be most effective when combined with actions such as relaxing constraints to providing higher flows and the implementation of the northern Basin toolkit, pre-requisite policy measures and some Sustainable Diversion Limit Adjustment Mechanism projects.

Influence of other factors

Several factors can affect whether the expected environmental outcomes are met (e.g. a dry sequence of years, ecosystems that don’t respond as predicted) and depending on circumstances, these may drive different outcomes than expected. Other complementary actions, such as management of aquatic pests and removal of barriers to fish movement, will also affect the ability to achieve these outcomes—as will broader changes in land management. Defining expected outcomes is still important though to ensure there is a benchmark against which to measure progress.

The Basin’s climate is also changing, with warming temperatures, shifting rainfall patterns and more frequent extreme weather events such as storms, droughts and floods. Climate change is affecting water availability in the Basin, although we are yet to fully understand what these changes may mean for the Basin Plan and the associated social, economic, cultural and environmental outcomes. The MDBA is working to anticipate these impacts and published a [discussion paper](#) in February 2019 that explains our research project.

The MDBA will review the expected environmental outcomes as part of the next update of the Strategy, to take account of measures to address constraints, projects under the Sustainable Diversion Limit Adjustment Mechanism and northern Basin toolkit, and the impacts of climate change.

Managing to prevailing conditions

The Basin's variable climate means that environmental watering needs to be responsive to both historical conditions and the forecast availability of water.

The practice of managing environmental water in response to water resource availability scenarios has been adopted over the past 15 years by most environmental water holders in the Basin. Various combinations of climate condition and water availability result in different levels of flow from year to year and therefore different categories of resource availability i.e. very dry, dry, moderate, wet, and very wet. Different outcomes will be sought depending on the prevailing resource availability scenario.

The Strategy outlines environmental management objectives and outcomes appropriate for each resource availability scenario. In moderate years for example, environmental water might be used to connect the river to billabongs via higher flows, whereas in a dry year water may be used to support baseflows.

Annual watering strategies to achieve expected outcomes for native vegetation, waterbirds and native fish are listed for each resource availability scenario and inform annual environmental watering priorities.

Future work

The updated Strategy identifies work the MDBA will do in cooperation with Basin governments, environmental water holders, river operators, First Nations people and other key groups to inform the next update, expected in 2022. This work includes:

- First Nations' objectives and outcomes for shared benefits of environmental water
- Water management strategies to improve flow coordination
- Ensuring the best possible environmental outcomes from environmental watering while investigating opportunities to improve social and economic outcomes
- Improved SMARTness of expected environmental outcomes and better links to Basin Plan objectives
- Additional environmental themes where it can be demonstrated that they add value to Basin-wide environmental watering. This includes ecosystem functions
- Assessing climate risks to the expected environmental outcomes and water management strategies.

More information

Read the full Basin-wide environmental watering strategy and the report of the review

Submissions received on the draft updated Strategy can be found on the MDBA platform [Get Involved](#).

More information about water for the environment under the Basin Plan at:

<https://www.mdba.gov.au/managing-water/water-for-environment>

