2026-2036

CONSULTATION DRAFT

WIMMERA WATERWAY STRATEGY

A HEALTHY WIMMERA CATCHMENT WHERE A RESILIENT LANDSCAPE SUPPORTS A SUSTAINABLE AND PROFITABLE COMMUNITY.

VICTORIA State Government Australia

Wimmera CMA

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Publication details

Wimmera Waterway Strategy – consultation draft

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We acknowledge the Traditional Owners and other Aboriginal and Torres Strait Islander Peoples across the region and pay respect to Elders past, present and emerging.

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Acronyms

Basin Plan	*Murray-Darling Basin Plan*
BGLC	Barengi Gadjin Land Council
BEWS	*Basin-wide Environmental Watering Strategy*
CMA	Catchment Management Authority
DEECA	Victorian Government Department of Energy, Environment and Climate Action
EMAC	Eastern Maar Aboriginal Corporation
EPA Act	*Environment Protection Act 2017*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
GWMWater	Grampians Wimmera Mallee Water
MERI	Monitoring, Evaluation, Reporting and Implementation
The Plan	*Implementation Plan for the Wimmera Waterway Strategy*
The Strategy	*Wimmera Waterway Strategy*
Wimmera CMA	Wimmera Catchment Management Authority

INTRODUCTION

The Wimmera Catchment Management Authority (Wimmera CMA) is pleased to present the Public Consultation Draft of the third *Wimmera Waterway Strategy* (the Strategy). This 10-year plan sets the direction for managing the Wimmera's rivers, streams, wetlands and floodplains.

The Strategy provides a framework for waterway managers, First Nations People, and regional communities to work together to sustain Wimmera waterways and the values they support. Waterways play a vital role in the environmental, social, cultural, and economic wellbeing of western Victoria's Wimmera region. The Strategy focuses on improving waterway condition while supporting these values for residents and visitors.

The Strategy guides government and other investment towards priority locations and actions for river, stream, and wetland management. It sets a pathway for achieving the *Wimmera Regional Catchment Strategy's* outcomes for waterways and identifies regional priorities to be delivered through a separate 10-year implementation plan.

Wimmera CMA developed the Strategy in partnership with First Nations People and in collaboration with a wide range of stakeholders, including regional communities.

A wetland in the south-west Wimmera

First Nations Introduction

The Wimmera region includes the traditional lands of the Wotjobaluk, Jaadwa, Jadawadjali, Wergaia and Japagulk Peoples of the Wotjobaluk Nations represented by the Barengi Gadjin Land Council Aboriginal Corporation, and the Eastern Maar represented by Eastern Maar Aboriginal Corporation (see Figure 1).

Barengi Gadjin Land Council serves as trustee for the Native Title rights and interests of the Wotjobaluk, Jaadwa, Jadawadjali, Wergaia and Jupagulk Peoples of the Wotjobaluk Nations - collectively known as the Wotjobaluk Nations Peoples - as recognised in the Native Title Consent Determination of 13 December 2005. This landmark determination was the first of its kind in Victoria and affirmed, among other things, the ongoing connection between the Wotjobaluk Nations Peoples and an area covering much of the Wimmera region and its waterways. (1)

Here is an introduction to People and Country in their own words.

> "We are part of our Country and our Country is part of us.
>
> Bunjil the creator, made our land, waterholes, animals, and plants and gave the Bram-bram-bult brothers, sons of Druk the frog, the responsibility to finish the tasks he had set for himself. They had to bring order to the new world by naming the animals and the plants, and to make the languages and give the Lore.
>
> This is why Wotjobaluk Nations Peoples are obligated to look after Country and Culture and keep it healthy and strong.
>
> Country heals us: it connects us to our dreaming stories, to our ancestors and spirits. It is the foundation of our future.
>
> All parts of Country are connected and if our Country is treated with respect and care, then it will continue to sustain and provide for us.
>
> It is vitally important that we continue to share our traditional land management practices so the land, waters and all living resources can thrive."
>
> - Barengi Gadjin Land Council

Culturally modified tree in Barrabool Flora and Fauna Reserve

Eastern Maar Aboriginal Corporation

Wimmera CMA acknowledges the deep cultural knowledge, aspirations and rights of Eastern Maar Peoples in caring for Country, including the waterways, wetlands and landscapes within Eastern Maar Country. We recognise Eastern Maar Aboriginal Corporation (EMAC) as the Registered Aboriginal Party and the custodian of cultural knowledge for their Country.

We are committed to working in partnership with EMAC to ensure their perspectives, priorities and cultural values are appropriately reflected in this Strategy. Sections referencing Eastern Maar Country, knowledge or aspirations remain placeholders until further discussion and guidance from EMAC can be incorporated.

Wimmera CMA looks forward to continuing this collaborative process and will update the Strategy following the consultation draft in a manner that respects EMAC's aspirations for Country and supports self-determination in waterway management.

Staff from Eastern Maar Aboriginal Corporation and Wimmera CMA inspecting a culturally modified tree

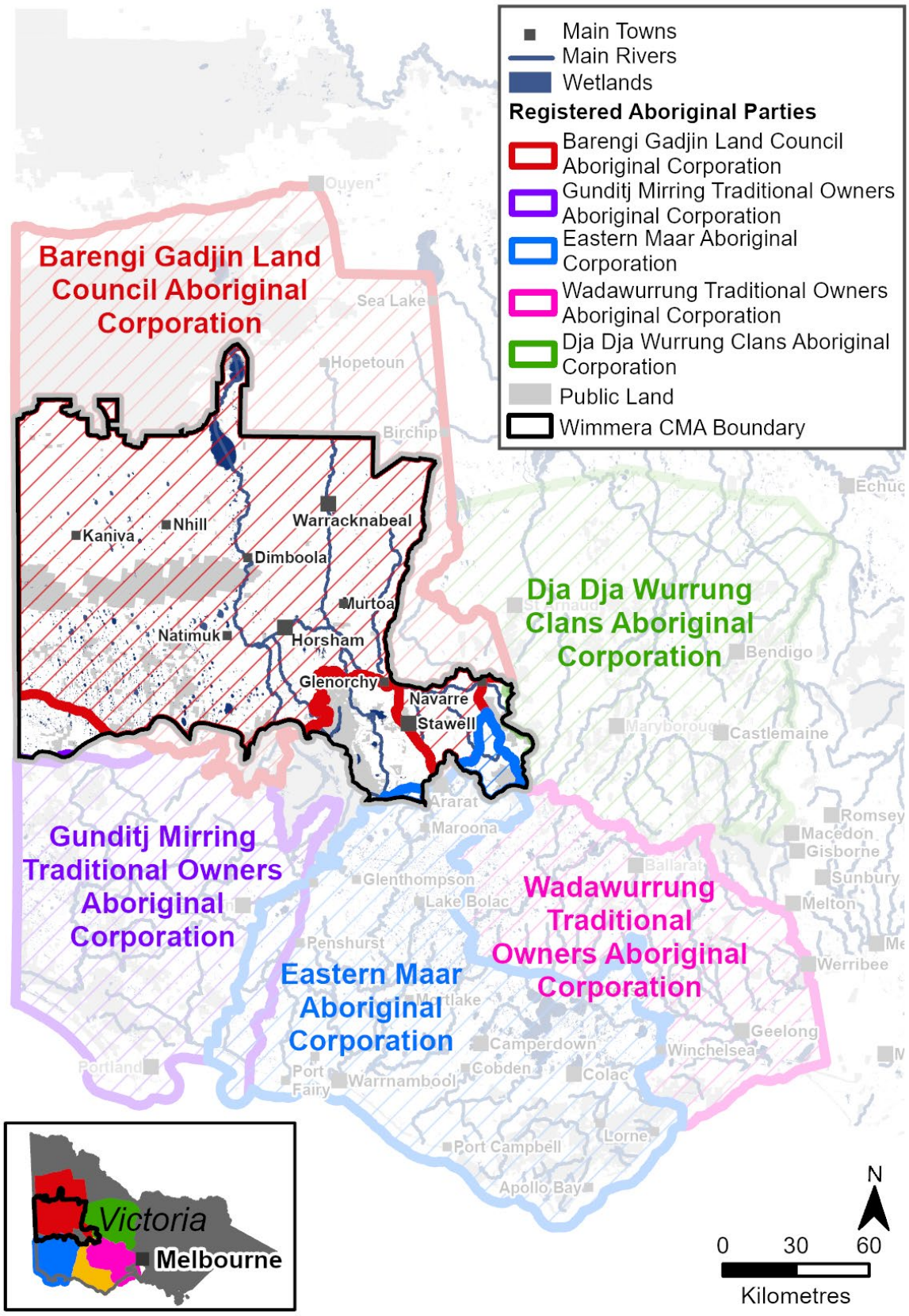


Figure 1. Registered Aboriginal Party areas in the Wimmera region.

CONSULTATION DRAFT

PART A

STRATEGY SUMMARY

VICTORIA State Government Australia

Wimmera CMA

STRATEGY SUMMARY

What information is included in the Regional Waterway Strategy?

The requirements and expectations for developing regional waterway strategies are outlined in the *Ministerial Guidelines for regional waterway strategies* issued by the Minister for Water. (2)

The Guidelines describe the scope of the regional waterway strategies as: "*planning for rivers, wetlands, and their floodplains, collectively known as 'waterways', including consideration of the whole of catchment and cross-regional context as appropriate*."

Ministerial Guidelines stipulate that regional waterway strategies must be developed and implemented by waterway managers, in partnership with Traditional Owners, local communities, private landholders, relevant statewide and regional agencies and boards and other key stakeholders. (2)

Implementation of the Wimmera Regional Catchment Strategy

Wimmera CMA developed the *Regional Catchment Strategy* in 2021 in collaboration with the Wimmera community and partner organisations. It sets a long-term vision and desired outcomes for the Wimmera's water, land, and biodiversity.

The *Wimmera Waterway Strategy* provides a plan for achieving the *Regional Catchment Strategy*'s desired outcomes for rivers, streams, wetlands and floodplains.

What the waterway strategy covers

The Strategy will describe:

- Wimmera waterways and their importance to the community, including the environmental, economic, social and cultural benefits they provide.
- Threats and challenges that may impact waterways.
- A 10-year plan for contributing progress towards achieving the Wimmera region's:
    - Long-term vision for water, land and biodiversity.
    - Long-term (>20-year) and medium-term (<10-year) desired outcomes for waterways that contribute to achieving this vision.
- Priority areas for implementing management actions to achieve desired outcomes.

A separate *Implementation Plan* will include the management actions required for achieving the region's desired outcomes for waterways.

A *Monitoring, Evaluation, Reporting and Implementation (MERI) Plan* will set out how progress towards achieving management outcomes will be assessed as well as an evaluation process for the Strategy document.

What is not included in the waterway strategy

During consultation for the Strategy, many stakeholders raised concerns about water availability. Questions focused on whether sufficient water exists for new allocations to developments and pipelines, and the potential impacts on existing users and the environment. Stakeholders also expressed concern about a drying climate, reduced runoff into storages, and the risk that increased extraction could harm waterway health and social, economic, and cultural values.

Water allocation and sharing arrangements are outside of the scope of the Strategy and are considered by the *Western Region Sustainable Water Strategy*. Sustainable water strategies seek to secure a region's long-term water supply and can identify threats to water availability and water quality. (3)

During 2025 the Victorian Government announced that the sustainable water strategy covering the Wimmera region will be reviewed and updated. (4)

Flood management and rural drainage considerations are generally outside of the scope of the *Wimmera Waterway Strategy*. The *Wimmera Floodplain Management Strategy* outlines priority actions for flood management in the Wimmera. This strategy, developed by Wimmera CMA in consultation with local government and other stakeholders, identifies priority flood management activities such as flood warning systems and improving flood overlays in land use planning schemes.

Policy context

Preparing a *Regional Waterway Strategy* is required under the *Water Act 1989*, which recognises nine Catchment Management Authorities and Melbourne Water as responsible for developing these strategies within their waterway management districts.

The *Regional Waterway Strategy* provides a 10-year plan to guide strategic and coordinated investment in waterway management. It outlines actions to balance waterway values and uses, achieve regional outcomes, and align with broader frameworks such as government legislation and policy, the *Wimmera Regional Catchment Strategy*, *Western Region Sustainable Water Strategy*, and Traditional Owner Nation Statements and Country Plans.

Key Victorian legislation and policy frameworks informing the Strategy are:

- *Water Act 1989* – requires catchment management authorities to develop regional waterway strategies and work programs.
- *Victorian Waterway Management Strategy* (in development) – provides the statewide policy framework for waterway management and guides regional strategies.
- *Water is Life: Traditional Owner Access to Water Roadmap* – supports Traditional Owner self-determination in water access and management while balancing stakeholder rights and entitlements.

Appendix 1 lists relevant policies and legislation, while Figure 2 shows how the Strategy connects to national, state, and regional plans. As a sub-strategy of the *Regional Catchment Strategy*, it provides direction for achieving waterway outcomes in collaboration with stakeholders and the community.

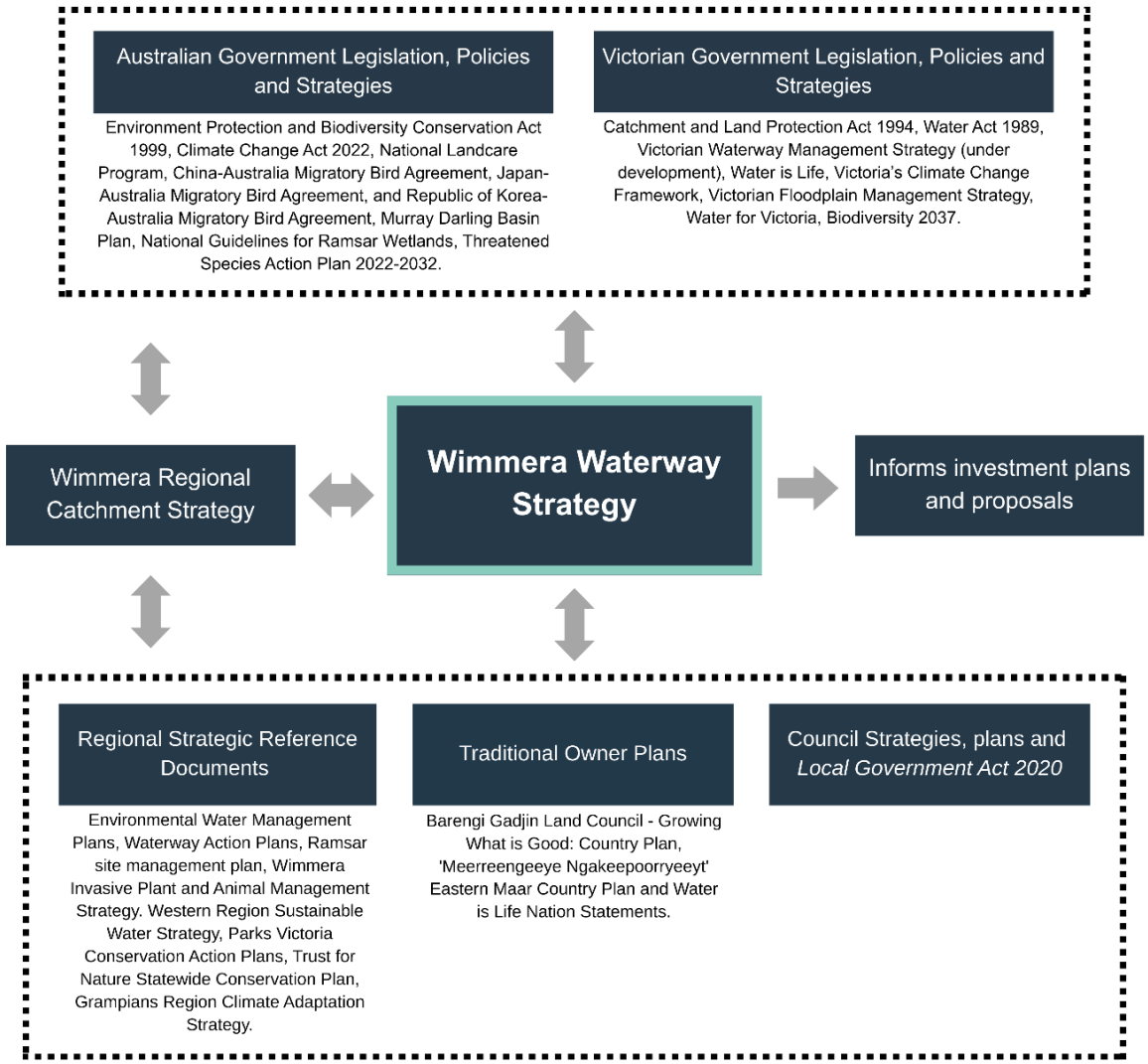


Figure 2. National, state and local policies, legislation and documents that guide, complement and align with the Wimmera Waterway Strategy.

Review of the previous strategy

In 2022-23, Wimmera CMA reviewed the previous strategy, the *Wimmera Waterway Strategy 2014-2022*, confirming strong progress in improving waterway health and management across the region. The review also highlighted important lessons and considerations to guide the next strategy.

Over its eight-year life and beyond, the strategy provided clear direction for investment and action, guided regional planning, and strengthened partnerships with First Nations People, agencies, and communities.

The strategy delivered a wide range of environmental, social, economic, and cultural benefits for the Wimmera region.

Strategic Integration

The previous waterway strategy informed the *Wimmera Regional Catchment Strategy 2021–27* and supported funding applications for priority waterway projects. It also informed strategic and project planning for regional stakeholder organisations and groups such as Landcare, local government, and recreational management committees.

Environmental outcomes

The strategy significantly improved waterway health through extensive on-ground works:

- Over 4,000 ha of pest control, 4,600 ha of weed control, 162 km of fencing, and 486 ha under riparian management agreements were implemented to protect riparian areas and wetlands, reduce erosion and improve habitat quality. The Victorian Government's *Regional Riparian Action Program* enabled substantial gains in invasive species control and riparian protection.[1]
- Native vegetation restoration and rabbit control at waterways such as Lake Albacutya Ramsar site helped maintain ecological character and biodiversity with the condition of vegetation including nationally threatened pine-buloke communities enhanced by targeted rabbit control.
- Strategic environmental water releases supported aquatic ecosystems, improving aquatic habitat, sustaining fish and platypus populations, and maintaining drought refuges and water quality. The Wimmera River's resilience to a major blackwater event in 2021 was positive. Infrastructure upgrades and erosion control works reduced sediment movement and improved water quality, creating a lasting legacy for waterway resilience.

Ongoing challenges remain for water quality and erosion, particularly in the lower Wimmera River, upper catchment and West Wimmera.

Cultural and community benefits

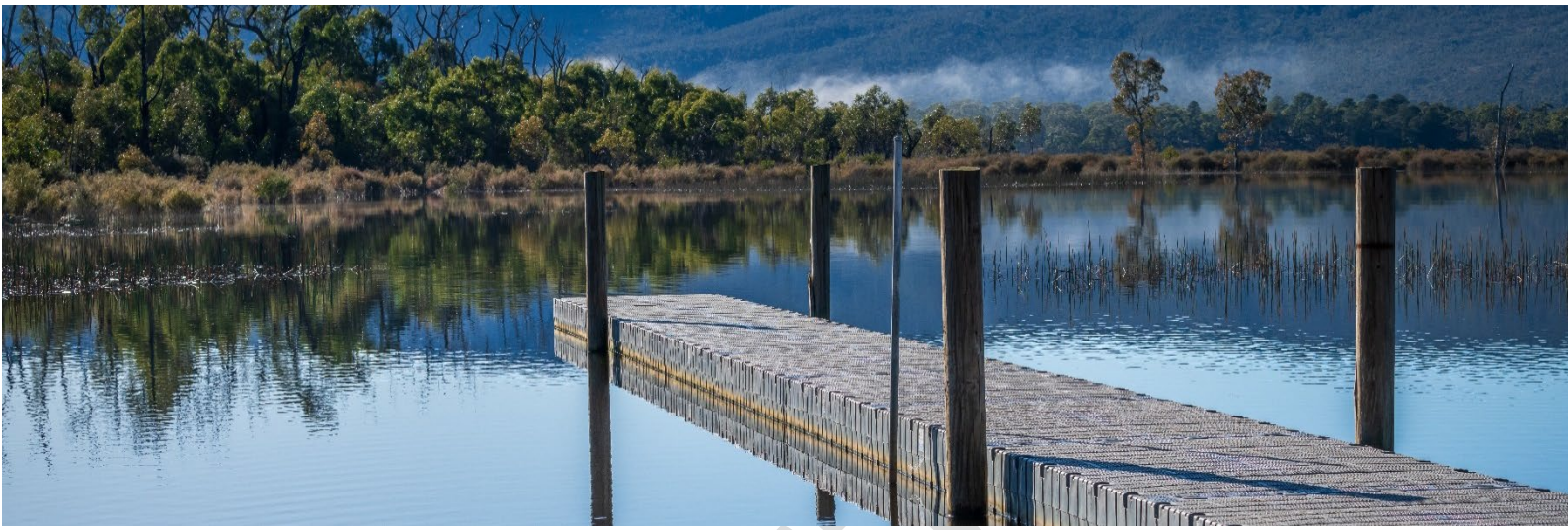
Traditional Owner involvement in waterway management increased through Aboriginal Water Officer roles, cultural watering projects, and collaborative planning.

Landholder trust in Wimmera CMA as a reliable partner grew along with confidence that recommended practices like fencing waterways and off-stream watering points improve environmental outcomes.

Wimmera CMA delivered numerous activities to raise awareness about waterway health and encourage action. Community education initiatives included major events like Horsham annual fishing competition wildlife presentations and cultural heritage projects such as *Virtual River Yarns*.

Adaptive management

Wimmera CMA and other organisations successfully adjusted priorities in response to drought, floods, bushfires, and new government policies, demonstrating flexibility and responsiveness.



Lake Wartook, Grampians National Park

Key learnings

A key focus of the next Strategy will be to build on these achievements while addressing emerging challenges. The review of the 2014–2022 strategy highlighted several important considerations for shaping the future approach.

Climate resilience

Planning for a drying climate, reduced flows, and extreme events by improving resilience, prioritising drought refuges, strategic environmental watering, and bushfire risk management to protect waterway health.

Improved monitoring and evaluation

Discontinued statewide programs limited outcome tracking. Many targets focused on monitoring outputs rather than measurable outcomes, underscoring the need for improved monitoring frameworks.

Address knowledge gaps

Target research on wetland hydrology, fish populations, erosion processes, and social drivers of landholder participation to inform evidence-based management decisions.

Strengthen partnerships and shared benefits

Build on strong collaborations with Traditional Owners, agencies, and community groups to deliver environmental, cultural, recreational, and economic benefits through integrated waterway management.

Community engagement

Adopt innovative approaches to maintain and increase landholder involvement, considering education programs, extension services, and market-based incentives.

Integrated catchment management

Ensure actions deliver multiple benefits for the environment, culture, recreation, amenity, and economy, while aligning with government policy directions such as *Water for Victoria* and *Water is Life*.

Maintain Ramsar site values

Continue monitoring and protecting the Lake Albacutya Ramsar site and explore opportunities for expanding the listing to safeguard internationally important wetlands.

The review confirmed that the *Wimmera Waterway Strategy* delivered significant improvements and provided a strong foundation for the next strategy. By applying these lessons, future waterway management can be more adaptive, inclusive, and effective in sustaining the Wimmera's waterways and the values they support.

Developing the Strategy

Wimmera CMA is leading the development of the *Wimmera Waterway Strategy* with valuable contributions from a range of partner organisations, groups and individuals with interests and expertise in waterway management.

Steps taken to develop the Strategy

Following the review of the previous strategy, steps taken to develop the new *Wimmera Waterway Strategy* included:

- Wimmera CMA sought to collaborate with First Nations groups to develop the Strategy, resulting in On Country discussions and multiple meetings.
- Wimmera CMA met with more than 35 stakeholder organisations and community-led groups involved in waterway and water management, natural resource management and sustainable agriculture in the Wimmera. Stakeholder representatives were invited to contribute their aspirations and priorities for Wimmera waterways and thoughts on challenges, issues and opportunities. Stakeholders expressed support for being involved in Strategy development via providing comments and feedback on Strategy drafts and further discussion with Wimmera CMA where needed.
- A working draft was developed informed by a range of information and evidence, including:
    - The strategic directions and outcomes established in the *Wimmera Regional Catchment Strategy 2021*.
    - Findings of the review of the *Wimmera Waterway Strategy 2014-22*.
    - The priorities and aspirations of stakeholder organisations and groups including First Nations groups provided during meetings with Wimmera CMA.
    - Feedback provided by Wimmera community members via an online form promoted through Wimmera CMA's website and social media platforms, and forums hosted by Wimmera CMA including an annual *Environmental Water Management Forum*.
    - Australian Government and Victorian Government legislation, strategies and policies.
    - Regional sub-strategies and action plans.
    - Best available scientific information and data, including investigations, reports, and monitoring assessments.
- In early November 2025, Wimmera CMA invited stakeholders to provide feedback and contribute to refining and improving the working draft of the Strategy. The draft was provided to a range of partner and stakeholder organisations and groups and Wimmera CMA's Board.
- Wimmera CMA refined the draft Strategy based on stakeholder feedback and submitted it to DEECA on 20 December 2025 for review and approval, prior to release for public consultation.

Current step

- Consult with the Wimmera community and stakeholders during a public consultation period from Thursday 2nd April until Monday 18th May 2026.

Next steps

- Following the public consultation period, Wimmera CMA will revise the draft taking into consideration feedback provided by the community and partner and stakeholder organisations.
- The final Strategy will be submitted to Wimmera CMA's Board for consideration for approval.
- Following Board approval, Wimmera CMA will submit the Strategy to DEECA for final review prior to it being submitted to the Victorian Government Minister for Water for consideration for approval.

Guiding principles

A set of principles guides the development and implementation of the Strategy, providing direction that assists with planning and decision-making. These principles provide guidance that:

- Ensures a consistent approach to decision-making and management actions supported by the Strategy.
- Supports waterway managers when faced with trade-offs, contrasting views from stakeholders or unclear evidence.

Waterway managers and partners are best placed to apply these principles given their understanding of local and broader contexts.

The principles align with the draft *Victorian Waterway Management Strategy* (in development), adapted to meet the Wimmera's regional circumstances and needs.

The following principles have guided the development of this Strategy and will inform the approach to the Strategy's implementation:

1. **Integrated catchment management –** Integrated management of waterways will occur in a broader framework of integrated and coordinated catchment management. This recognises the importance of waterways as part of connected systems, contributing to greater resilience of waterways, land, biodiversity, and communities.
2. **Partnership approach –** Waterway management is a partnership between government, First Nations People, stakeholder organisations and groups, industry and communities. Waterway managers will provide opportunities for partners and community to:
    - Participate in decision making.
    - Build regional capacity and knowledge to effectively manage waterways.
    - Facilitate appropriate community care of, use and benefits from waterways.
    - Use partnerships to generate additional support.
    - Secure long-term outcomes by developing a collective or shared responsibility for waterway management.
3. **First Nations Peoples' self-determination –** Waterway managers are committed to partnering with First Nations People to improve the management of waterways on Country. Waterway managers will seek to collaborate with First Nations groups where opportunities exist. The Strategy acknowledges and respects First Nations Peoples' obligations and rights to care for water and country and to increase the role of traditional ecological knowledge, provided with consent, to inform waterway management activities on Country. Traditional Owners always maintain sovereignty over their cultural data and information.
4. **Climate change and waterway planning -** Waterway management will apply a climate change adaptation lens, that considers predicted climate change impacts within the context of other pressures on the environment and other socio-economic drivers.
5. **Value for money -** Public investment in waterway management will be directed to actions, activities and approaches that provide the most efficient and cost-effective progress towards long-term outcomes for the greatest public benefit, considering opportunities for multiple benefits.
6. **Evidence-based decision making -** Waterway management will be informed by the best available knowledge and the precautionary principle. Management action will be risk-based and proportionate. Ongoing monitoring and evaluation will facilitate adaptive management. **Good governance -** Waterway management activities will be delivered effectively and strategically using a transparent, coordinated, and integrated framework.
7. **Maintain outcomes of previous investment -** Previous effective on-ground waterway management activities that align with government policy and priorities will be considered within future strategies and work programs to ensure that outcomes are consolidated.
8. **Quadruple bottom-line decision making -** Decision making will integrate considerations for environmental, social, cultural and economic values of waterways and seek to maximise overall benefits of management actions that maintain and improve condition in priority areas.
9. **Adaptive management –** Effective monitoring, reporting, evaluation and research will support continuous improvement in managing waterways.

CONSULTATION DRAFT

PART B

WIMMERA WATERWAYS - OVERVIEW

VICTORIA State Government Australia

Wimmera CMA

OUR REGION

The Wimmera catchment and waterways

Wimmera waterways are significant natural assets that are fundamental in supporting life and prosperity across the Wimmera. The region's rivers, streams, wetlands and floodplains provide essential habitat for native plants and wildlife, places of cultural significance for First Nations People, valuable nature-based recreation and tourism opportunities, and essential water supply for towns, farms and industry.

Victoria's Wimmera catchment includes both the Wimmera Basin, which is a southern section of the greater Murray-Darling Basin, and the Millicent Coast Basin, which extends into south-eastern South Australia.

The catchment covers 10% of Victoria, spanning 2.3 million hectares. More than 77% of the catchment's land is used for agricultural production. In 2023, 57% of the catchment was dedicated to broadacre cropping and almost 20% to agricultural livestock production. Non-agricultural uses such as urban environments and nature conservation areas made up the remaining land use. (5)

The Wimmera's population is approximately 50,000 with around one third of residents living on farms or in small townships with fewer than 2,000 people.

Major waterways in the region include the Wimmera River system, which features an extensive network of tributary streams, two distributary streams, and ultimately feeds into a series of large inland freshwater lakes.

The region contains more than 3,400 wetlands including deep permanent freshwater and saline lakes and shallow seasonal freshwater and saline wetlands. The range of different types of wetlands supports a large diversity of plants and wildlife.

The catchment's waterways are influenced by a temperate to semi-arid climate. Severe droughts and large floods make for variable hydrology and the adaptation of unique riparian and aquatic ecosystems.

Five local areas, based on municipal and sub-catchment boundaries, make up the Wimmera catchment. These are Hindmarsh, Horsham, West Wimmera, Yarriambiack and Buloke, and the Upper Catchment, which includes parts of Northern Grampians, Ararat and Pyrenees municipalities. **Error! Reference source not found.** shows the catchment and its major attributes.

Rivers and streams

The Wimmera River, the largest inland-terminating river in Victoria, is the most significant waterway in the catchment. It flows from near Mount Cole in the catchment's southeast and spills into a terminal lakes system in the catchment's north.

Wimmera River flows originate upstream of Glenorchy where multiple tributaries including Mount Cole, Glenlofty, Glenpatrick and Concongella Creeks gather run-off from the Pyrenees ranges and Ararat foothills. The river then travels westerly to Dadswell's Bridge where Mount William Creek joins the river.

The river continues west to Horsham where it is joined by tributary streams originating from the northwestern slopes of the Grampians ranges, including Burnt Creek, MacKenzie River and Norton Creek. The river then tracks north through Dimboola, fringing the eastern edge of the Little Desert National Park, and onto Jeparit.

The river terminates at Lake Hindmarsh, Victoria's largest freshwater lake. During extremely wet periods that fill Lake Hindmarsh, water spills into Outlet Creek, flowing north to a series of terminal lakes including internationally important, Ramsar-listed Lake Albacutya and beyond to Wirrengren Plain in the Mallee region.

Yarriambiack Creek, which ends at Lake Corrong near Hopetoun, and Dunmunkle Creek, which dissipates in the southern Mallee near Lascelles, are notable distributaries. Both creeks flow north out of the Wimmera River during high river flows and floods.

The Millicent Coast Basin covers the western part of the Wimmera, extending south into Victoria's Western District and west into south-eastern South Australia. It includes several streams that flow west into South Australia. The basin's largest waterway is Mosquito Creek, flowing into South Australia's Bool and Hacks Lagoons Ramsar Site near Naracoorte.

Figure 4 shows the main rivers and streams in the Wimmera.

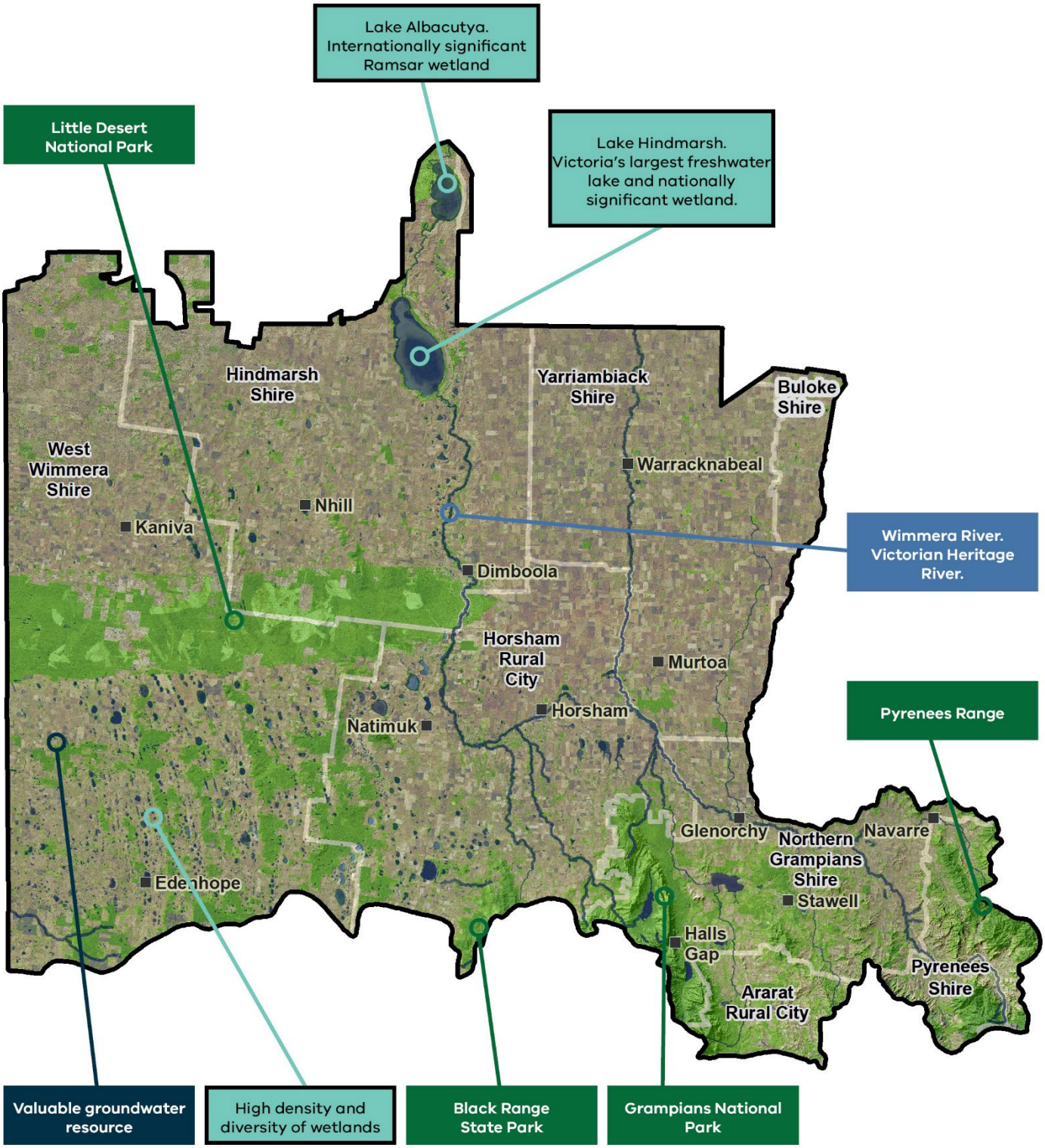


Figure 3. The Wimmera Catchment

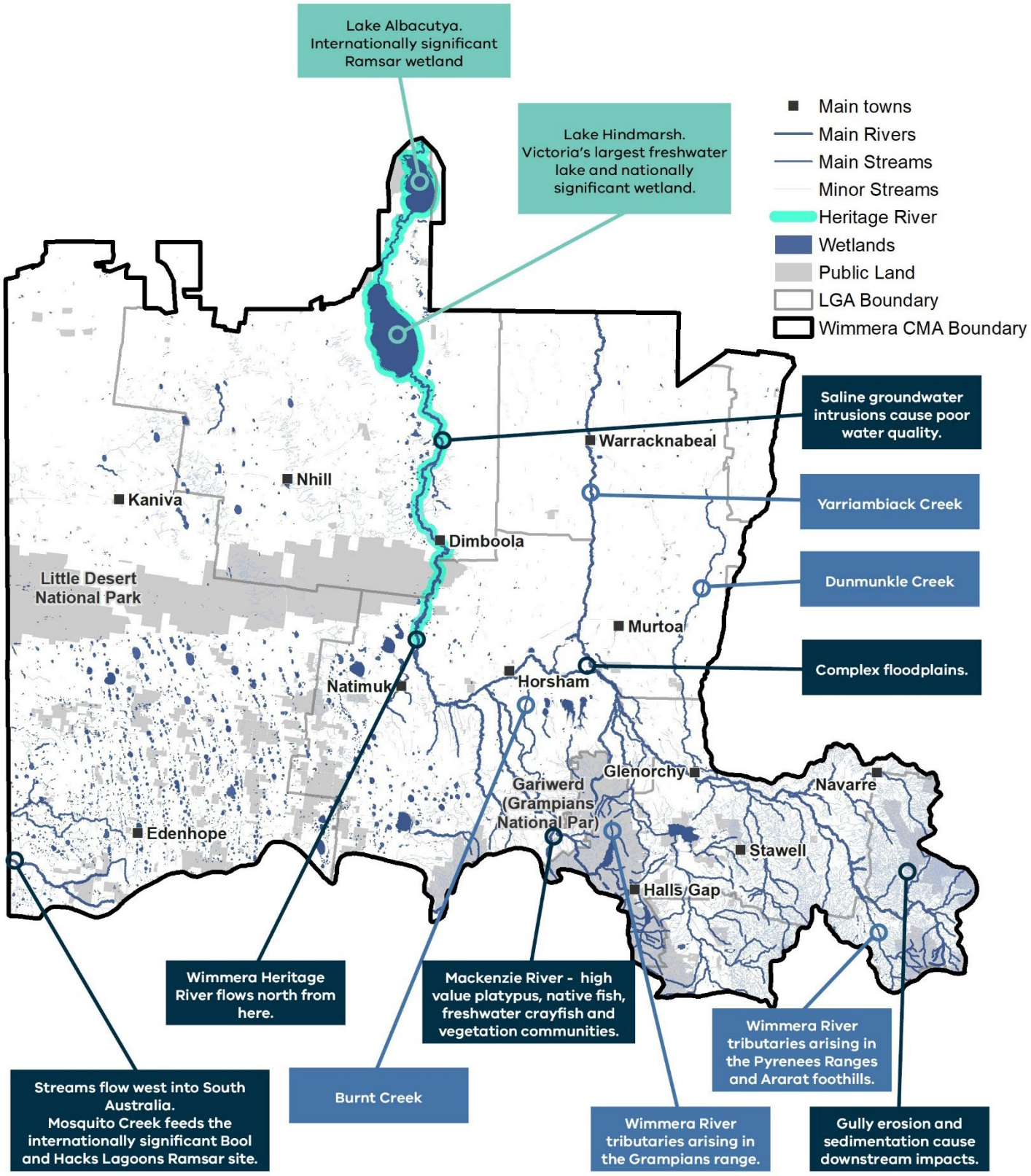


Figure 4. Major rivers and streams in the Wimmera

Wetlands

The Wimmera has a high abundance and diversity of wetlands and related natural values. There are more than 3,400 wetlands in the region covering an area of over 75,000 hectares. This represents approximately a quarter of Victoria's depressional (not linked to rivers or streams) wetlands. (6)

The Victorian Department of Energy, Environment and Climate Action (DEECA) defines wetlands as "*any area of land that is inundated with water – that may be standing or running, fresh or saline – with sufficient frequency and/or duration for the water to influence the plant and animal communities and ecological processes that occur there*." (7)

Examples of wetlands in the Wimmera include lakes, swamps and billabongs. Constructed wetlands include reservoirs and dams, where they support wetland plants and animals.

Most wetlands fill from catchment runoff and fill seasonally or intermittently, depending on annual climate conditions. A small number are filled from pipeline allocations. Lake Marma and Watchem Lake, in addition to Warracknabeal and Brim weir pools on Yarriambiack Creek, receive recreational allocations from the Wimmera Mallee Pipeline. Thirteen additional wetlands in the region's north-east receive piped environmental water via the Wimmera Mallee Pipeline under a Victorian Environmental Water Holder entitlement.

There are also wetlands and lakes operating as catchment water-supply storages, including lakes Bellfield, Fyans, Taylors, Wartook and Lonsdale. These also have recreational and environmental value.

While wetlands occur across the whole Wimmera region, most wetlands are on private land (90%) in the Wimmera's west and Millicent Coast Basin.

Wimmera wetlands are highly diverse in terms of their hydrology, salinity and native vegetation composition. The Wimmera includes a range of freshwater, shallow, seasonal and periodically inundated wetlands, permanent deep lakes and shallow and deeper groundwater-fed saline wetlands.

Most Wimmera wetlands are seasonal freshwater depressions (89%) which fluctuate between wet and dry cycles. Less than 1% are classed as permanent fresh lakes with the remainder being mainly saline. (8)

This variety contributes to high wetland biodiversity, with the different categories of wetland supporting a highly diverse mix of plant, bird, macroinvertebrate and other wetland species.

Wimmera wetlands can be grouped into sub-regions or wetland systems based on their geographic characteristics and management issues (Figure 5):

1. **Terminal lakes of the Wimmera River**
    - Including internationally important Lake Albacutya Ramsar site, nationally important Lake Hindmarsh, Ross Lake, Outlet Creek and other wetlands filled from flooding flows in the Wimmera River. Also includes the Wirrengren Plan in the Mallee region to the north.
2. **Natimuk-Douglas Chain of Lakes**
    - A "chain" of saline and freshwater lakes of global bird conservation importance.
    - Eleven wetlands listed as nationally important.
3. **South–west Wimmera wetland system**
    - Major wetland complex, supporting high biodiversity.
    - Includes Seasonal Herbaceous Wetlands (freshwater) of the Temperate Lowland Plains, listed as Critically Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
4. **Northern Wimmera Plains wetlands**
    - Scattered wetlands in an intensively cropped landscape.
    - Pink Lake is nationally important.
    - Thirteen receive piped environmental allocations when water is available.
5. **Wetlands of the Upper Wimmera River catchment**
    - Scattered seasonal freshwater wetlands.
    - Regionally important water supply storages and recreational lakes.

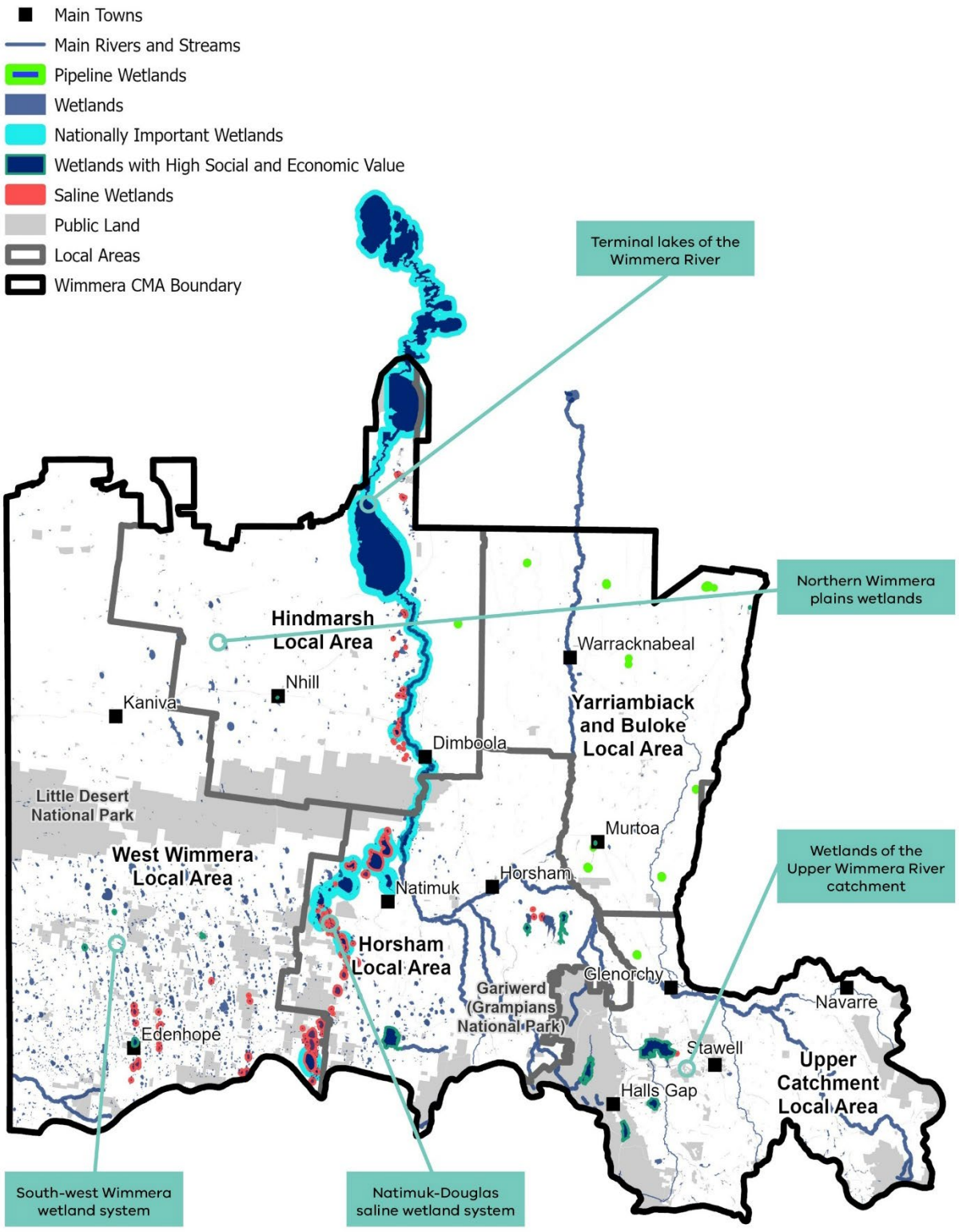


Figure 5. Wetlands and major wetland systems in the Wimmera.

Significant waterway assets

The Wimmera region is home to rivers, streams and wetlands of exceptional environmental, cultural, and recreational importance. These assets provide critical habitat for threatened species, support biodiversity, and hold deep cultural significance for First Nations People. They also contribute to regional identity and community wellbeing through recreation, amenity and tourism.

Environmental Values

Wimmera waterways and their adjoining floodplains form complex, richly diverse ecosystems. They sustain a wide array of native plants, animals and communities - many of which are threatened or endangered - and drive the movement and cycling of sediment and nutrients across the landscape.

These systems also serve as a crucial interface between aquatic and terrestrial realms, providing habitats, refuges and corridors that underpin regional biodiversity.

The Wimmera's rivers, streams, wetlands and floodplains support natural ecosystems by providing sanctuaries in and corridors through a highly agricultural landscape.

Native aquatic species that rely on Wimmera waterway health and connectivity include the Wimmera's last known population of platypus (*Ornithorhynchus anatinus);* a rare and isolated Wimmera clade of river blackfish (*Gadopsis marmorata)*; fragmented populations of small-bodied fish such as southern pygmy perch (*Nannoperca australis);* rarely seen western swamp crayfish *(Gramastacus insolitus);* and an abundance of bird, frog, mammal, reptile and insect life integral to the region's ecological food chain.

Some Wimmera species relying on Wimmera waterways are listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Victorian *Flora and Fauna Guarantee Act 1988.* Examples include the regent parrot (*Polytelis anthopeplus)*; brolga (*Antigone rubicunda*); and white-bellied sea eagle (*Haliaeetus leucogaster*).

Waterways, wetlands and riparian corridors are important to Wimmera bird life, attracting a variety of waterbird species, particularly in wet periods. Wimmera waterways also provide refuge for migratory waterbird species, including when there is drought in other parts of Australia.

Wimmera wetlands play an important role in supporting intercontinental migratory shorebirds such as the red-necked stint (*Calidris ruficollis)* and sharp-tailed sandpiper (*Calidris acuminata),* listed on the *Japan-Australia Migratory Bird Agreement*, *China-Australia Migratory Bird Agreement,* and *Republic of Korea-Australia Migratory Bird Agreement*. There is also the gull-billed tern *(Gelochelidon nilotica macrotarsa)*, listed as endangered under the Victorian *Flora and Fauna Guarantee Act 1988*. Hotspots include Lake Hindmarsh and wetlands in the Natimuk-Douglas Chain of Lakes system.

Lake Albacutya, in northern Wimmera, is one of Victoria's 12 Ramsar-listed wetlands of international importance. It was listed for its outstanding environmental values, including habitat for the nationally threatened regent parrot, a genetically unique population of river red gum, and large numbers of waterbirds. The lake also holds deep cultural significance and is a popular recreation site.

The lower Wimmera River, from Polkemmet Bridge, north-west of Horsham through to the terminal lakes, Outlet Creek and Wirrengren Plain in the Mallee has been classified as a Heritage River under the *Heritage Rivers Act 1992.* [9]

Several Wimmera wetlands are listed in Australia's Directory of Nationally Important Wetlands, based on their ecological significance. Wetlands include Heard Lake, Bitter Swamp, Natimuk Lake, Mitre Lake, Friedman's Salt Lake, Lake Wyn Wyn, White Lake, Lake Hindmarsh, Saint Marys Lake, Hateley's Swamp, Oliver's Swamp, Pink Lake (Lochiel), and Grass Flat (Telfer's) Swamp. Sections of the Wimmera River (downstream of Polkemmet Bridge to Wirrengren Plain) and Natimuk Creek (between Natimuk Lake and Lake Wyn Wyn) are also listed.

Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains are listed as a critically endangered ecological community under the EPBC Act 1999 due to their decline and ongoing threats from drainage, vegetation clearing, weeds, climate change, grazing, and loss of connectivity. Many occur in the southern Wimmera, but further data is needed to confirm their number, location, and condition.

Cultural Values

First Nations Communities maintain enduring and deep-rooted connections to the region's waterways. These connections are formally recognised through Registered Aboriginal Parties, Barengi Gadjin Land Council and Eastern Maar Aboriginal Corporation. Native Title Determinations cover the Wimmera River and much of the tributary and distributary system.

Barengi Gadjin Land Council serves as trustee for the Native Title rights and interests of the Wotjobaluk, Jaadwa, Jadawadjali, Wergaia and Jupagulk Peoples of the Wotjobaluk Nations - collectively known as the Wotjobaluk Nations Peoples - as recognised in the Consent Determination of 13 December 2005. This landmark determination was the first of its kind in Victoria and affirmed, among other things, the ongoing connection between the Wotjobaluk Nations Peoples and an area covering much of the Wimmera and its waterways. [1]

The Eastern Maar Aboriginal Corporation manages native title rights for the Eastern Maar Peoples. EMAC is a formally recognised Registered Aboriginal Party, with responsibilities for protecting and managing cultural heritage across a broad area extending to Landsborough in the Wimmera catchment management region.

As the representative body for Eastern Maar citizens, the Eastern Maar Aboriginal Corporation leads the advancement of native title rights and interests, cultural heritage protection, high-quality policy advice, and initiatives aligned with the inherent rights, aspirations, and independence of its people. (10)

The region's river and wetland systems have extensive cultural values and many waterways are recognised as Special Places by First Nations People. Ongoing collaboration seeks to strengthen partnerships for the health of People and Country, and support actions that reflect local situations, relationships and existing agreements.

Social Values

Wimmera waterways substantially enhance the region's livability and contribute to the wellbeing of Wimmera residents. Many Wimmera townships are located alongside rivers, streams, wetlands and floodplains, reflecting their importance to people's wellbeing. Water-retaining weirs at Horsham, Dimboola, and Jeparit on the Wimmera River and Warracknabeal and Brim on the Yarriambiack Creek support and promote community well-being via the benefits of tourism, recreation and aesthetic appeal.

GWMWater supplies Lake Marma at Murtoa, Watchem Lake, Warracknabeal weir pool and Brim weir pool with piped recreational water allocations, providing recreational water security to supplement natural flows and runoff in wet periods. This is part of a group of 15 lakes and weir pools in the broader Wimmera-Mallee region. (11)

Other recreational lakes of importance to local communities include Lakes Wallace, Natimuk, Charlegrark, Fyans, Lonsdale, Hindmarsh and Toolondo, Green Lake near Horsham, and Nhill Lake and Swamp.

The Wimmera River system is a base for a variety of community recreational interests including angling, rowing regattas, camping, birdwatching, sightseeing, swimming, skiing and canoeing.

The Wimmera River regularly hosts community fishing competitions in Horsham, Jeparit and Dimboola, the largest being Horsham's annual Labor Day long weekend event. In 2025, the Horsham competition - running since 1972 - attracted about 1,000 entrants, consistent with its 10-year average. (12)

Horsham's riverbank, including the riverfront meeting place, Sawyer Park, soundshell, playpark reserves, walking and bicycle tracks are also the foundation for major events.

Dimboola's Rowing Regatta and barefoot ski jump competition on the Wimmera River are major community attractions. Additionally, the Wimmera River Discovery Trail, following the river between Dimboola and Jeparit, is an emerging tourist attraction which opened in late 2025, and spans 56 kilometers.

Other lakes and wetlands have historically provided settings for major community festivals and events. The foreshore of Murtoa's Lake Marma provides a base for Murtoa's Big Weekend, New Year's Eve celebrations and other community gatherings. Lake Charlegrark near Goroke is home to a major country music gathering and Lake Wallace at Edenhope provides the backdrop for the Henley on Lake Wallace festival. Horsham district communities have also used Green and Natimuk lakes for a multitude of sporting and community events including national sailing regattas, speed-boat racing and picnic carnivals.

Duck hunting and yabbying are popular recreational pursuits at Wimmera lakes, particularly in the region's south-west, attracting locals and visitors from outside the region.

The region's waterways, particularly the Natimuk-Douglas Chain of Lakes, provide bird-watching opportunities, supporting a high diversity of birdlife including local Wimmera birds, international migrants, and rare and endangered species.

Economic Values

The Wimmera's rivers, streams and lakes provide most of the water essential for towns, farms and industry in the Wimmera. Groundwater is also an important resource in the western part of the region.

New industries are emerging in the Wimmera which will require water supply. Integrated water management projects are being explored to reduce reliance on potable water.

Upper catchment water storages supply a large portion of the region with an affordable and efficient piped water supply. This saves farmers and landholders from the expense of water carting and storage losses. Without the Wimmera Mallee Pipeline, particularly looking forward to future climate scenarios, many farmers would struggle to have access to water in the dry and flat landscape.

Estimates from 2023 suggest community recreational activity involving waterways across the Wimmera municipalities of Horsham Rural City, Northern Grampians, Hindmarsh, Yarriambiack, West Wimmera and Buloke generated almost $30 million. (13) River-based community fishing contests at Horsham and Jeparit and a water-skiing event at Dimboola in 2022 alone generated a collective $830,000 for the region. (14)

Pink Lake - a popular tourist stop

Waterways with high social, recreational and economic value

Many Wimmera waterways have high social, recreational and economic value (see

Figure 6). These waterways are characterised by:

- High visitation by locals and tourists.
- High contribution to the local economy due to attracting visitors hosting community events such as rowing regattas, fishing competitions, and other gatherings.
- Are actively managed by a dedicated organisation or group for the purpose of recreation, amenity, tourism and economic contribution. For example, local council, Committee of Management, or Parks Victoria.
- Have been "activated," meaning the waterways are public spaces that have been enhanced or managed so that people are encouraged to use the space for a variety of recreational purposes.
- Attract tourists to the region or local area.

These waterways are very important to the Wimmera community but may not necessarily be the highest priorities for action over the life of the Strategy. Priorities depend on the level of threat to values and whether there is a need to take action to enhance recreational access and manage it sustainably to prevent impacts on the natural environment.

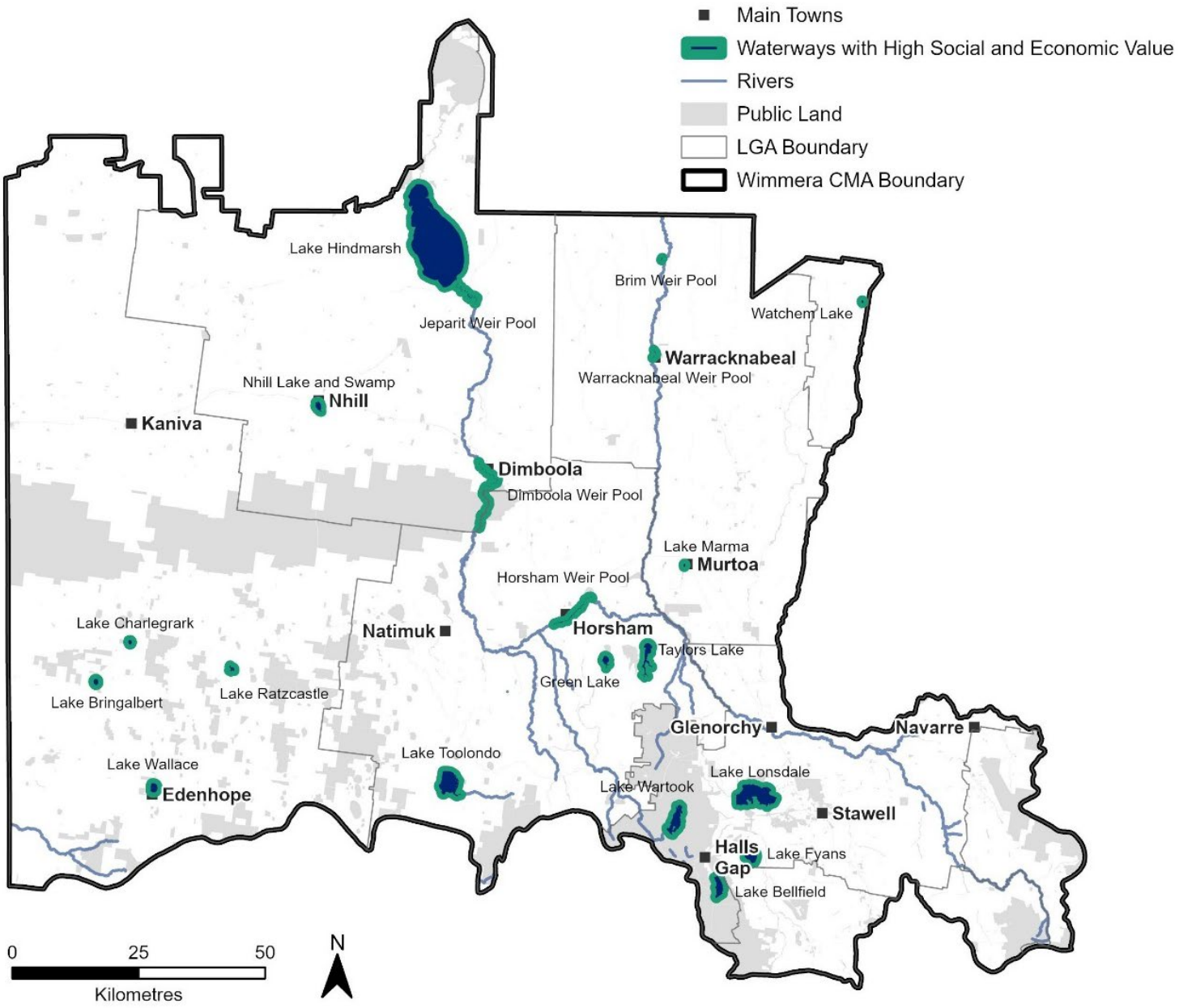


Figure 6. Wimmera waterways with high recreational, social and economic value.

Threats to waterway assets

Wimmera waterways face a range of pressures that threaten their environmental condition and the social, cultural and economic values they support. These threats vary across rivers, streams, wetlands and floodplains, but many are interconnected and compounded by climate change.

Key threats include:

Climate change and dry conditions

The Wimmera is experiencing a long-term decline in annual rainfall and runoff, which is reducing river and stream flows and lowering the frequency with which wetlands and lakes fill. At the same time, rising temperatures, more hot days and longer heatwaves are increasing evaporation. These changes place growing pressure on water resources, stress aquatic ecosystems, and contribute to algal blooms.

Environmental water allocations are also becoming more vulnerable. Under high or worst-case climate change scenarios, projections suggest these allocations could halve by 2065. [(15)]

Reduced water availability may result in loss of habitat, weakened connectivity, declining water quality, and a higher risk of species decline. These impacts are expected to be particularly evident in the lower Wimmera River, which depends on sufficient rainfall, runoff and streamflow from upper and mid-catchment tributaries - as well as environmental water deliveries - to maintain healthy conditions downstream.

The Wimmera River's terminal lakes system, including Lakes Hindmarsh and Albacutya, is also expected to receive water less often in a drying climate. Lake Hindmarsh typically holds water following high flows and flooding in the Wimmera River. For water to reach Lake Albacutya, and further north to the Wirrengren Plain in the Mallee, successive wet years with significant flooding are likely to be required.

Water quality decline

Water quality in the Wimmera is under increasing pressure from multiple factors. Saline groundwater intrusion, particularly in the lower Wimmera River during low-flow periods, impacts on aquatic species and stresses riparian vegetation.

Runoff from agricultural land and erosion in upper catchment tributaries add sediment and nutrients, increasing turbidity and the risk of algal blooms.

These conditions along with fires and floods increase the risk of harmful blue-green algae outbreaks and hypoxic blackwater events which threaten aquatic life and limit recreational use.

Habitat loss and fragmentation

The health of Wimmera waterways is compromised by riparian degradation, where clearing, stock access, and weed invasion reduce riparian vegetation width, condition and connectivity. This increases the risk of erosion and diminishes habitat quality for native species.

Similarly, wetland modification through cropping, grazing, and drainage works on private land is degrading wetland condition and function, with shallow seasonal wetlands particularly at risk. This includes seasonal herbaceous wetlands - listed as critically endangered.

These changes lead to a decline in habitat, reduced resilience to climate extremes, and the loss of ecosystem services.

Invasive species

Invasive plants and animals are a major threat to the health of waterways and riparian land. These environments are highly productive and frequently disturbed, making them especially prone to invasion. Their natural connectivity also enables pests to spread rapidly, as flowing water moves plant fragments, seeds and aquatic organisms across river systems and floodplains, especially during high-flow or flood events.

Across the Wimmera, a range of established invasive species are already affecting waterway condition. Introduced non-native fish, including carp (*Cyprinus carpio*), redfin (*Perca fluviatilis*), and mosquito fish (*Gambusia holbrooki*), compete with native fish, prey on eggs and juveniles, degrade habitat and increase turbidity.

Deer damage riparian vegetation and compact soils, while terrestrial pests such as rabbits, foxes and regionally established weeds invade riverbanks and wetland margins, reducing vegetation cover, destabilising soils and threatening wetland-dependent species.

Recreational activities can unintentionally introduce or spread weeds and pest animals, for example, through seed or mud carried on boats, trailers, vehicles, waders or fishing gear, or through the deliberate or accidental release of garden, aquarium or recreational fish species.

In some cases, the greatest current threat is the spread of invasive species already established within the region, while in others the risk comes from new incursions from outside the Wimmera. Preventing new introductions remains far more effective and cost-efficient than eradication or long-term control efforts and is a priority for future management.

Altered flow regimes

Water regulation and infrastructure such as weirs and storages have significantly changed natural flow patterns in the Wimmera. These alterations disrupt water flows, restrict fish movement, and interfere with essential ecological processes that sustain healthy waterways.

The consequences include reduced flows and water quality, reduced connectivity between habitats, changes to natural habitat structure, and greater vulnerability during drought periods.

Fire and flood

Bushfires in headwater catchments can destroy groundcover, leaving soil exposed and increasing the risk of sediment and ash washing into waterways after rain. This degrades water quality and threatens aquatic life. Similarly, floods and high-flow events can mobilise large amounts of sediment and nutrients, causing erosion and water quality issues.

The consequences of these extreme events include increased risks to aquatic ecosystems, water supply storages, and downstream communities.

Future challenges

The Wimmera region faces significant challenges in managing waterways under changing environmental, social and economic conditions. These challenges also present opportunities for innovation, collaboration and adaptive management.

New industry and development

New industrial and mining developments, including renewable energy and mineral sands mine projects emerging in the Wimmera, can alter rainfall runoff patterns and place additional pressure on waterways and water resources. These changes require careful environmental oversight to prevent long-term impacts on landscape hydrology and ecosystem health.

Extreme events

Floods, fires, and droughts pose significant risks to waterways. For example, fires in water supply catchments such as the Grampians National Park can remove ground cover, increasing the likelihood of ash and sediment entering waterways during subsequent rainfall events.

Artificial water-control structures

Weirs and other structures alter natural flow regimes, disrupting processes that support aquatic life. However, weir pools also present opportunities – providing socio-economic benefits for regional towns and drought refuges for water-dependent species. These values are likely to become increasingly important under climate change scenarios.

Balancing access with sustainable management

Balancing the desire for increased access to waterways in the Wimmera for recreation, amenity and socio-economic values with the need for sustainable management presents challenges for some waterways. On one hand, communities and visitors value these waterways for recreation, tourism, and cultural connection, which drives demand for improved infrastructure and accessibility.

On the other hand, the region's waterways are ecologically sensitive, supporting unique habitats and species that can be easily disrupted by overuse, pollution, and altered flow regimes. Climate variability and water scarcity further complicate this balance. Effective planning requires a careful approach that prioritises long-term sustainability, integrates community aspirations, and ensures that increased access does not compromise the ecological integrity of these vital systems.

Illegal activities around waterways

The potential for illegal activities to harm waterways is an ongoing concern. Such activities may include chemical dumping, littering, illegal firewood collection, the use of inappropriate fishing nets, and damage caused by four-wheel drives or other off-road vehicles. These actions can degrade waterways, pollute soils, degrade riparian vegetation and endanger wildlife as well as human health. (16)

Monitoring remote parts of the catchment is challenging, making it essential for agencies and the community to remain vigilant - observing, reporting and responding quickly to any illegal activity to help protect waterway health and values.

Invasive species

Victoria's Biosecurity Strategy highlights that biosecurity risks are intensifying, meaning that - despite best efforts - more pest and disease incursions are expected in the future. This growing risk is driven by:

- **Climate change.** Warming temperatures and more extreme weather events are enabling pests and diseases to spread into new areas. Associated biodiversity loss weakens natural ecosystem defences.
- **Rising trade, travel and online shopping** increase movement of goods and people, heightening the likelihood of new pest and disease incursions and spread. Garden plants, aquarium species and some recreational fish species also pose risks of accidental or deliberate introduction.
- **Changing land use and ownership.** In the Wimmera, growth in semi-rural "lifestyle" properties and absentee landholders are shifting regional biosecurity risks and influencing their management.

Victoria's Biosecurity Strategy emphasises that preventing and managing the harms caused by pests and diseases requires a coordinated, collective effort across government, industry, land managers and the broader community. [17]

Waterways and riparian land are particularly vulnerable to invasive species because they are highly productive environments that experience frequent natural disturbances, making it easier for invasive plants and animals to establish. Their connectivity can accelerate the spread of invasive species, as flowing water can move seeds, plant fragments and aquatic species throughout river systems and across floodplains, especially during high-flow and flood events.

Future opportunities

Future opportunities for waterway management in the Wimmera arise from emerging partnerships, technologies and approaches that can strengthen resilience and adaptation to a drying climate. The following considerations highlight areas where innovation and collaboration can deliver meaningful long-term benefits.

Strengthening partnerships with First Nations People

There are opportunities for continuous improvement in the way waterway managers and other partner organisations collaborate with First Nations People to enhance waterway condition. This includes joint activities at high-priority sites, such as cultural burning practices and activities to address vulnerable riverbanks and trees, which support both ecological and cultural values.

New technology and innovation

Emerging technologies such as artificial intelligence and drones, together with innovative management approaches, offer the potential to enhance management of waterway health across the Wimmera region. Continued exploration and adoption of appropriate tools can help address environmental challenges and maximise management efficiency.

Virtual fencing is an example of emerging technology that could support better waterway management. As it develops, it may help control livestock access to sensitive riparian areas, particularly where traditional fencing is vulnerable to flood or fire damage or difficult to install. Victoria approved virtual fencing for cattle in 2025, but its use for other livestock, including sheep, is still restricted. This limits its current usefulness in the Wimmera, where most landholders run sheep or mixed sheep-and-cattle operations. With further advances, and if proven safe, humane and effective for sheep, virtual fencing could help protect riparian areas in future.

Innovative water management solutions

Wimmera CMA is exploring the use of rural water supply pipelines to deliver environmental water directly to drought refuge pools during dry periods. This can use environmental water efficiently during times of scarcity, delivering water directly to large refuge pools without sending high volumes down entire river systems. Maintaining these pools helps aquatic species survive drought and recolonise waterways when flows return, while also providing refuge for terrestrial wildlife. This is a key climate change adaptation measure designed to strengthen resilience in priority Wimmera waterways.

If implemented in the future, new water supply pipelines could provide opportunities to enhance waterway resilience by delivering piped water to drought refuges in new areas.

Integrated water management presents a valuable opportunity to enhance the health and resilience of Wimmera waterways. By coordinating water use across urban, agricultural, and environmental sectors, integrated water management promotes more efficient water delivery and reduces competition for scarce resources. Water recycling and reuse schemes can play a critical role in this approach by reducing pressure on traditional water supplies and limiting the need to extract water from rivers, streams, wetlands and floodplains.

Facilitating dispersal of key species

Iconic Wimmera species such as the platypus and river blackfish experienced significant declines in range and numbers during the Millennium Drought. Today, they persist only in small, isolated, and vulnerable populations within the MacKenzie River. The completion of the Wimmera Mallee Pipeline Project in 2010 delivered large water savings, enabling environmental flows that have improved waterway condition and potential habitat for these species.

There is now an opportunity to support the dispersal of platypus and river blackfish into previously occupied areas that still provide suitable habitat. Expanding their range would strengthen the resilience and long-term security of Wimmera populations.

Climate change and water sharing

Growth in industry, expanded piped-water services, and the need to protect environmental, cultural, and community waterway values under climate change scenarios highlight the importance of efficient, effective and appropriate water sharing operational arrangements. These arrangements should reflect both current and future water demand and availability.

Fire management

There is an opportunity to adapt fire management practices to reduce the risks posed by increasing frequency, severity and scale of fire driven by climate change. A collaborative approach involving government, community, and agencies is essential for fire prevention, response, and recovery to protect water and catchments across Victoria. This approach must balance multiple priorities, including safeguarding life and property.

CLIMATE CHANGE

Climate change is significantly affecting water availability, water quality, and habitat integrity, posing major risks to local waterways, wildlife, and the communities that depend on them. Shifts in rainfall patterns - when and where it falls, how much falls and changes to inflows - are altering waterway conditions and challenging regional water and waterway management across the Wimmera.

Lake Wallace at Edenhope in the south-west Wimmera

Current impact

Clear signs of climate change are beginning to take hold across the region. A Bureau of Meteorology and CSIRO report noted that many predicted consequences under various greenhouse-gas-emission scenarios are already occurring. Over the 30 years leading up to 2019:

- Annual rainfall decreased by 9% from about 480 mm to around 440 mm.
- Dry years occurred 12 times and wet years five times.
- Rain decreased in autumn and spring months.
- The autumn 'break' was one to three weeks later - typically occurring in early to mid-May south of Horsham, and in late May to early June in the central and northern part of the region.
- More frosts occurred, including later in the season.
- There were more consecutive days where the temperature was above 40 degrees. (18)

This period included the Millennium Drought, a prolonged and severe drought from the late 1990s to 2010. There is evidence that a step-change may have occurred since 1997, where annual inflows to storages have not recovered (see Figure 7).

GWMWater's data from 1997 to 2025 shows a sharp decline in average annual inflows to Grampians water supply storages, driven by reduced rainfall and runoff to waterways.

Despite major investment in the Wimmera Mallee Pipeline to save water by replacing leaky channels, falling inflows continue to impact waterway health and water supply.

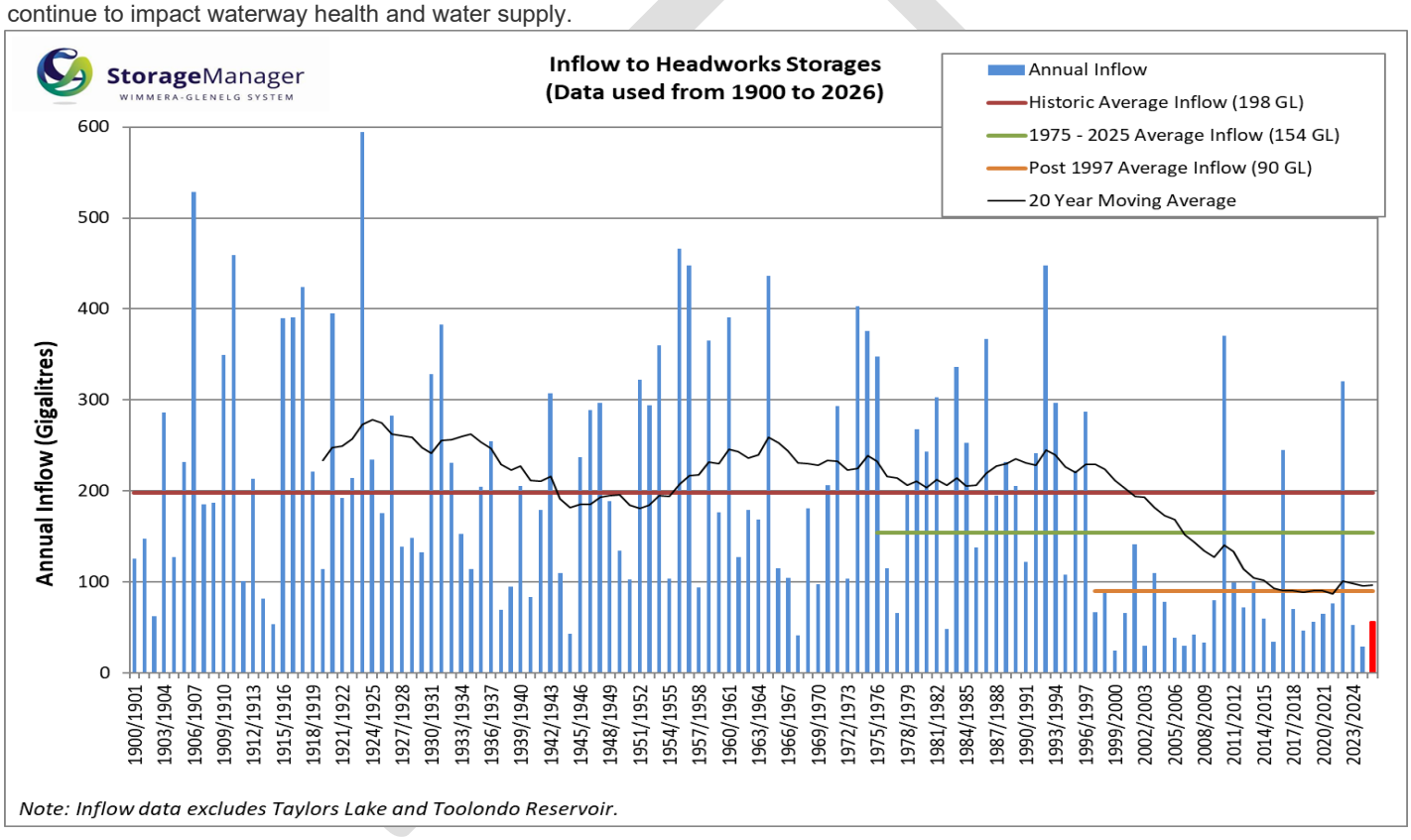


Figure 7 Since 1997, catchment inflows to storage lakes have fallen from an average of 198 GL to 93 GL per year. To put this in perspective, the average decline in water each year is equal to about 40,000 Olympic-sized swimming pools (34).

Reduced inflows limit water available for entitlements, including environmental flows to rivers, streams, wetlands and floodplains, passing flows, and water for piped recreational lakes. This directly affects flows in the mid and lower Wimmera River, Mount William Creek, MacKenzie River, and Burnt Creek systems, as well as four recreational lakes and 13 piped wetlands across the catchment.

Natural flows are declining, turning some waterways, such as Mosquito Creek, from permanent baseflow systems into intermittent streams. Cease-to-flow events are becoming more frequent in rivers, terminal lakes, and wetlands. Large lakes once considered permanent - such as Natimuk Lake and Lake Wallace - now fill only occasionally and often function as shallow seasonal wetlands supporting high numbers of waterbirds. Many smaller seasonal wetlands remain dry for extended periods, with filling frequency dropping from annually to once every 3–5 years. These changes have driven land-use shifts, with some landholders taking advantage of drier conditions to move from sheep grazing to broadacre cropping in the south-west Wimmera, even opportunistically cropping wetland beds during dry years.

Wimmera Mallee Pipeline

Efforts to reduce climate-related risks to water supply and improve flows to waterways in the Wimmera and neighbouring Mallee intensified during the Millennium Drought, which lasted from the late 1990s to 2010. (20)

Completed in 2010, the Wimmera Mallee Pipeline was designed to improve regional water security while creating opportunities for environmental watering. The project replaced 17,500 kilometres of evaporation- and seepage-prone earthen channels with more than 9,000 kilometres of rural pipeline.

Based on historic inflows to regional storages, the pipeline was expected to save an average of 103 billion litres of water each year. Although climate change has reduced actual savings due to declining rainfall and runoff, the pipeline remains critical in ensuring water supply for people, farms and the environment. Without the system, major waterways would experience little to no flow and significant ecological decline, and many towns and rural properties would lack a secure water supply.

The pipeline has enabled the delivery of environmental entitlements and passing flows, as well as water to drought refuges and isolated wetlands, supporting recovery since the Millennium Drought. However, as a regulated system, it alters natural flow patterns and cannot fully compensate for reduced rainfall. Annual rainfall and inflows remain fundamental to the health of waterways.

The Northern Mallee Pipeline spans 3,650 km and covers 890,000 hectares. Completed in 2004, it replaced 17,500 km of inefficient channels that lost up to 85% of water during transfers, providing a more reliable supply from Grampians storages. Water for the pipeline is now sourced from the Murray River.

The Commonwealth Environmental Water Holder holds a 28 gigalitre low-reliability entitlement in the Wimmera system. This entitlement, which becomes available only in wetter years once higher-priority needs are met, was created through the purchase of irrigation rights in 2012. It can supply water to the Wimmera River and lower Mount William Creek. The Commonwealth Environmental Water Holder received allocations in two of the thirteen years between 2012 and development of this Strategy in 2026.

Predicted climate impacts

Average annual temperatures are expected to rise by 0.9-1.4°C by 2050 and up to 3.1°C by 2090 under high emissions scenarios. (19) This warming will bring more hot days and longer heatwaves, increasing stress on water resources. Rainfall patterns are projected to remain variable, but cool-season rainfall (autumn and winter) is likely to decline, reducing soil moisture. (18)

Summer rainfall changes are less certain, but the overall trend points toward greater drought risk and reduced water availability.

The region faces a future of warmer temperatures, declining rainfall reliability, and increased climate extremes, requiring adaptation strategies in water and waterway management, agriculture, and community planning.

The Murray-Darling Basin Authority's *Draft Report Climate Change and Water Quality Risk Assessment Framework* describes likely climate change impacts on Wimmera rivers and streams. In summary: Upland waterways - whether permanent or intermittent - are increasingly vulnerable to more frequent and intense fires. Fire can accelerate erosion, adding sediment and nutrients to streams. When perennial rivers dry and become intermittent, they face a higher risk of low-oxygen (hypoxic) conditions when flows return.

Water storages may experience longer and more frequent algal blooms due to rising water temperatures and nutrient and sediment-rich inflows from fire-affected catchments.

Instream weir pools and deep waterholes are likely to see more stratification and mixing events, potentially triggering low dissolved oxygen, harmful algal blooms, and fish deaths. Overall, waterways will shrink and restart more often, with these stop-start cycles degrading water quality and increasing risks of hypoxia and algal outbreaks. (20)

An assessment of climate change vulnerability for wetlands in Victoria found that, under worst case drying scenarios, the interval between wetland inundation events would increase from around once every one to two years to once every four years. However, wetlands should continue to persist in the landscape under other drying scenarios. (21)

Water for the environment

Climate change and a drying climate are also reshaping how 'water for the environment' entitlements are managed. Weather patterns since 2010 show a major rain event roughly every six years, filling storages and causing flash floods rather than the gradual catchment wetting of the past. While these events deliver large natural flows, careful management of the environmental water entitlement between high-flow periods is essential to meet ecological needs. For example, if rivers and tributaries are meeting optimal conditions, environmental releases may be reduced to conserve water for future seasons. [(22)]

Water quality

Future climate-induced impacts on water quality will primarily be driven by reduced flows (resulting from reduced rainfall run-off), increased temperatures and an increase in extreme events. Changes in seasonal rainfall patterns will also likely impact water quality.

Impacts in the Wimmera are likely to include an increased risk of blue-green algae events, black water events and high salinity levels in some parts of the catchment. These events stress waterway species and can restrict waterway use by the community.

Resilience, transition and transformation

Adapting to longer periods of dry weather and less water in the landscape centres on continuing to build a foundation of environmental and community resilience. Regional waterway managers, farms and other businesses, and Wimmera residents have continued to adapt to changing scenarios and a drier climate.

The Third *Victorian Waterway Management Strategy* (draft in development) provides three adaptation guidance approaches to help inform the planning and management of waterway values and outcomes. These are:

1. Resilience – the ecosystem or value will be impacted but has the capacity to recover to its previous state. Management involves minimising the impacts of threats and supporting existing waterway values to be maintained or improved, persisting or being restored in their current locations.
2. Transition – the ecosystem or value will be impacted and will not recover to its previous state. Waterway values can change in structure or composition. Management involves supporting existing waterway values and systems to incrementally move to a new state by maintaining the integrity of ecosystems and processes.
3. Transformation – the ecosystem or value will be impacted when a step change or tipping point is reached and will not recover to its previous state. This may result in new waterway values and new management outcomes. Waterway values and systems may need to be managed in novel ways to address the root causes of vulnerability. This is especially important for those undergoing rapid and significant transformation, or those that have already reached a tipping point and changed irrevocably, such as following an extreme event.

This Strategy's approach to adapting to the impact of climate change aligns with this broader statewide policy.

Building resilience and supporting transition and transformation

Planning for water scarcity in the Wimmera is not new. Regional water management has long recognised water as a finite resource and invested in systems to improve efficiency and secure supply. This includes saving water via the Wimmera Mallee Pipeline, establishing environmental water entitlements and managing them to support waterway values like native fish, platypus and vegetation during dry conditions.

As the Wimmera faces a drying climate, waterways will need to adapt to new conditions. Some changes will occur naturally, while others will require active intervention to protect environmental, cultural, social and economic values. This Strategy embraces Victoria's *Resilience, Transition and Transformation Framework*, ensuring that management actions anticipate and respond to these shifts.

Opportunities to increase resilience

Despite the dry forecast for the Wimmera under climate change predictions, there are substantial opportunities to increase waterway resilience and retain important waterway values in the region.

- Environmental water – Managing available environmental water to protect and enhance waterway values - such as water quality, fish populations, and aquatic and riparian vegetation - in regulated rivers, streams and wetlands.
- Restoring values lost during the Millennium drought - Many waterways suffered severe ecological decline during the Millennium drought. Pipeline savings and targeted environmental water delivery can continue the recovery of species such as river blackfish, platypus, and small-bodied native fish, as well as instream and riparian vegetation.
- Maintaining drought refuges - Protecting and managing refuge pools during extended dry periods will be essential for sustaining aquatic life and biodiversity.
- The Victorian Government's review of the *Western Region Sustainable Water Strategy* commencing in 2026 will plan for the sustainable use of water resources across Victoria's Western Region, including the Wimmera. The review may provide opportunities to consider improvements to water operations and infrastructure that enhance environmental water outcomes in priority waterways. (23)
- Disaster preparedness and recovery - Planning to prevent, minimise, and recover from extreme events - particularly bushfires in headwater catchments for key waterways such as the MacKenzie River, Upper Wimmera, Mount Cole, Fyans, and Mount William - will help maintain ecological integrity.
- Upper catchment erosion control - Works to stabilise erosion and maintain riparian groundcover are more critical than ever. Reduced flows mean less dilution of pollutants, increasing pressure on water quality. Partnerships with landholder groups such as Project Platypus and Perennial Pasture Systems will be vital.
- Supporting community wellbeing - Dry conditions heighten the importance of local waterways for recreation, tourism, and amenity. Enhancing access and maintaining waterway health will support regional livability and economic resilience.

Transitioning and transforming to new states

Some waterways have shifted ecological states, and further transitions are expected. For example, some lakes once considered permanent or near permanent are now experiencing longer and more frequent dry periods, or prolonged phases holding shallow water. This Strategy acknowledges these transitions and seeks to manage them in ways that protect priority ecological functions, cultural heritage, and community benefits. Where possible, interventions such as piping water to drought refuges and maintaining connectivity will help ecosystems adapt to new flow regimes and ecological states.

Environmental watering at the Carapugna wetland – Yarriambiack and Buloke local area

CONSULTATION DRAFT

PART C

VISION, OUTCOMES & PRIORITIES

VICTORIA State Government Australia

Wimmera CMA

VISION

The *Wimmera Regional Catchment Strategy* sets the long-term vision for integrated catchment management. It outlines what the region aims to achieve over the next 50 years and beyond:

> *"A healthy Wimmera catchment where a resilient landscape supports a sustainable and profitable community."*

This vision shapes the sub-strategy, the *Wimmera Waterway Strategy,* and its long- and medium-term desired outcomes for waterways.

Achieving this vision for waterways beyond 2076 will mean:

- Waterways are healthy and part of a healthy catchment.
- Waterways, ecosystems, and species are resilient within a resilient landscape.
- Waterways contribute to a sustainable and profitable community.

Burnt Creek - Horsham local area

THEMES AND LOCAL AREAS

The *Wimmera Waterway Strategy* is built around two themes and five local areas.

Themes

These themes align with the waterway themes in the *Wimmera Regional Catchment Strategy*:

1. Rivers and streams
2. Wetlands

Local Areas

The five local areas are based on local government and sub-catchment boundaries. Each area highlights a distinct part of the region and shows how the themes apply locally.

The Wimmera's local areas (shown in Figure 8) are:

1. Hindmarsh
2. Horsham
3. Upper Catchment (including parts of Ararat, Northern Grampians and Pyrenees local government areas)
4. West Wimmera
5. Yarriambiack and Buloke.

Waterway asset groups

River, stream, and wetland assets are grouped by their characteristics and location within each local area. Grouping similar assets helps with planning and management by bringing together places with comparable condition, values, threats, and management needs.

Wimmera waterway asset groupings (see Figure 8**Error! Reference source not found.**) are:

1. Hindmarsh
    a. Lower Wimmera River and terminal lakes system
        - Including Outlet Creek, Lake Hindmarsh and Lake Albacutya
    b. Northern Wimmera Plains wetlands (central)
2. Horsham
    a. Mid Wimmera River
    b. MacKenzie River, Burnt Creek and Bungalally Creek
    c. Horsham wetlands, including the Natimuk-Douglas Chain of Lakes
3. Upper catchment
    a. Upper Wimmera River and tributaries
    b. Mount William Creek and tributaries
    c. Upper catchment wetlands
4. West Wimmera
    a. South-west Wimmera wetlands
    b. Northern Wimmera Plains wetlands (western)
    c. Mosquito Creek and west-flowing streams
5. Yarriambiack and Buloke
    a. Yarriambiack and Dunmunkle Creek
    b. Northern Wimmera Plains wetlands (eastern).

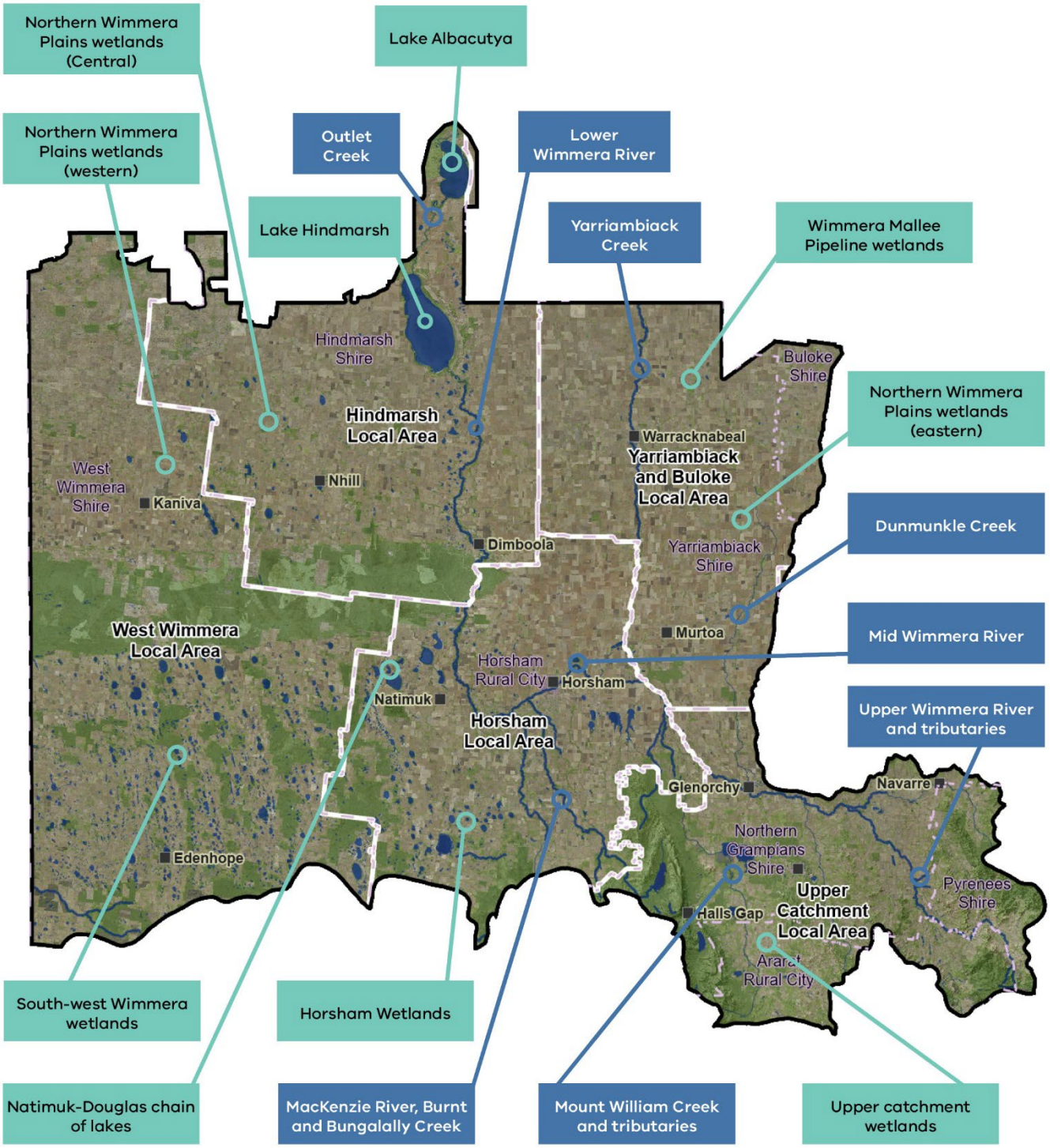


Figure 8. Local areas and waterway assets in the Wimmera region.

OUTCOMES

The *Wimmera Regional Catchment Strategy* (2020-21) sets the region's desired outcomes for integrated catchment management. It outlines 20-year long-term and 6-year medium-term outcomes for waterways, land, biodiversity and community. These outcomes are brought together across the region's five local areas.

The *Wimmera Waterway Strategy* is the sub-strategy for waterways. It provides the 10-year plan for achieving the catchment strategy's waterway-related outcomes.

Long-term outcomes are aspirational and expected to take 20 years or more to achieve, with some likely requiring additional time.

Medium-term outcomes are designed to be "SMART":

- **Specific** about what stakeholders and the community aim to achieve for land, water, biodiversity and community.
- **Measurable**, with indicators detailed in the *Regional Catchment Strategy's* MERI Plan.
- **Achievable**, given available resources, community capacity and climate change.
- **Relevant**, contributing to the regional vision and based on best available information about waterway condition, threats, priorities, feasibility and stakeholder aspirations.
- **Time-bound**, to be achieved over 10- and 20-year timeframes.

Medium-term outcomes act as stepping stones toward the region's long-term outcomes and 50-year vision.

Figure 9 illustrates how medium-term outcomes link to long-term outcomes and the regional vision.

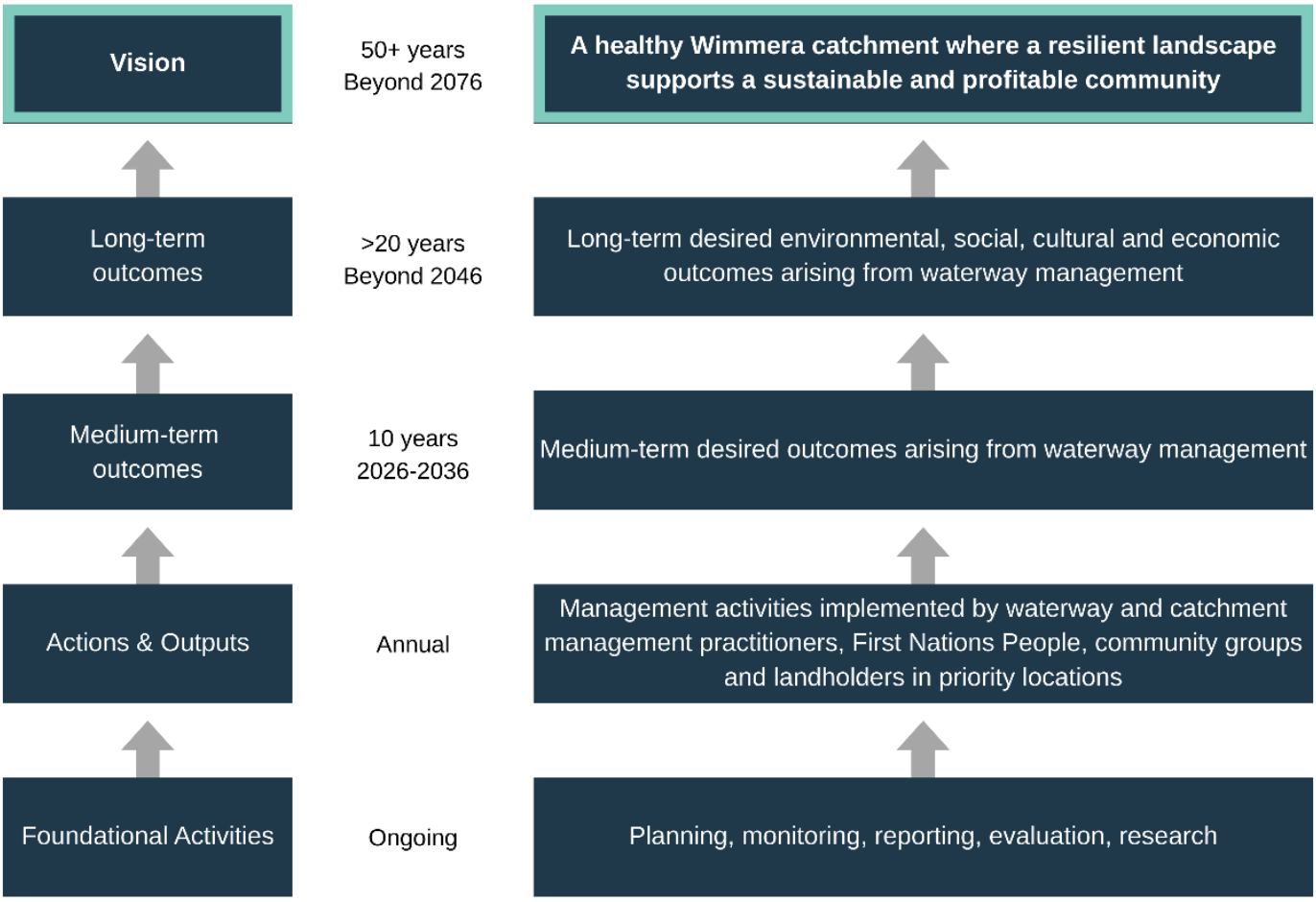


Figure 9. Vision, outcomes and actions hierarchy.

Wimmera CMA has reviewed the *Regional Catchment Strategy's* 6-year medium-term outcomes to confirm appropriateness for inclusion in the *Regional Waterway Strategy* as <10-year medium-term outcomes. Most were appropriate to carry across, reflecting the strong stakeholder and community input that shaped the *Regional Catchment Strategy*.

Minor edits and additions were made to keep the outcomes current, and some similar outcomes were combined across river, stream and wetland themes to improve conciseness. This approach maintains a clear line of sight between the two strategies.

The contribution of regional outcomes and the broader Strategy to Murray-Darling Basin outcomes established in the *Basin-wide Environmental Watering Strategy* were also considered. This ensures that environmental water management decisions address both local objectives and their contribution to broader Murray-Darling Basin outcomes. Further information is provided in Appendix 2.

The *Regional Catchment Strategy* already has a *Monitoring, Evaluation, Reporting and Implementation Plan*, meaning most monitoring requirements are well established.

There are many important outcomes to achieve for Wimmera waterways. The outcomes included in the Strategy represent the most important, based on best available science and community and stakeholder knowledge.

Desired outcomes for Wimmera waterways

Long-term outcomes (>20 years)

1. Knowledge and experience of First Nations People is informing waterway planning, management and delivery in the Wimmera, advancing self-determination.
2. Values and condition of waterways with formally recognised significance are maintained or improved.
3. Waterway condition, connectivity and resilience is improved, providing habitat that supports native species and communities.
4. Water is of sufficient quality to support waterway values and uses at important areas for water supply, cultural, environmental and social values.
5. Waterways with high environmental, social, cultural and economic values are maintained.
6. Wimmera people are active stewards taking action to care for waterways.

Medium-term outcomes (<10 years)

1. Ongoing collaboration and two-way learning in waterway planning and management, supporting self-determination and strengthening partnerships with First Nations People.
2. More waterways have improved management to enhance habitat, landscape connectivity, and resilience.
3. Wetland modification, loss and deterioration of condition occurs at a declining rate.
4. Drought refuges support species' survival and resilience during dry periods.
5. Risks to water quality in Wimmera waterways are managed where possible to reduce impacts on values.
6. More waterways provide improved recreational opportunities and amenity while minimising impacts on environmental values.
7. Healthier waterways enable more On Country activities for First Nations People.
8. Key water-dependent species are supported in waterways that provide suitable habitat, including during dry conditions.
9. Net rates of streamflow interception from water extraction and storages are stabilising in the Wimmera River catchment.
10. Stewardship increases, with more people taking action to care for waterways.

WATERWAY PRIORITIES

What are high priority waterways?

Wimmera waterways hold significant environmental, cultural, social and economic value. The natural environment is interconnected, and all water, biodiversity and land assets have importance.

Although all waterways matter, it is not feasible to actively manage every river, stream, wetland and floodplain across the region within a 10-year period.

The region's priority waterways represent the most important areas for management to achieve the region's desired outcomes for rivers, streams, wetlands and floodplains. Focusing management effort on these waterways will deliver the best value benefits for habitat, connectivity, cultural values, native fish, recreation and community wellbeing across the Wimmera.

For example, a waterway in excellent condition may be a low priority if no major threats are present. Conversely, it may be a high priority if its values are at risk from threats such as invasive species, low flows or bushfire.

A waterway may also be prioritised if practical management actions can enhance its values in line with First Nations Peoples', community or stakeholder aspirations – such as improving opportunities for sustainable recreation.

Additionally, waterways may be high priority when threats in one location pose risks to downstream values. For example, eroding tributaries in the upper Wimmera River catchment require management to reduce sediment impacts on habitat in downstream reaches.

A separate *Implementation Plan* outlines the actions to be carried out for high-priority waterways during the life of the Strategy.

Low and medium priority waterways for management

Many important waterways may be rated low or medium priority for regional-scale investment over the 10-year life of the *Wimmera Waterway Strategy*. This does not mean management actions cannot occur - only that limited funding and resources are directed first to higher-priority areas.

Management actions may still take place in low- or medium-priority waterways when:

- There is strong community desire to enhance or maintain the waterway in line with desired outcomes.
- Local groups or individuals show strong commitment to caring for the waterway.
- New opportunities arise that previously did not exist - for example, a change in land ownership enabling stock to be excluded from riparian areas.
- External funding becomes available from sources outside the Strategy, such as philanthropic grants or local government or industry programs.
- New threats emerge that were not present when the Strategy was developed that could affect desired outcomes.
- Waterway processes pose a serious risk to public infrastructure, or there is an opportunity to reduce risks from extreme events such as floods, bushfire or drought.
- Management effort is required to meet statutory or regulatory obligations.

Prioritisation process

The prioritisation process for the *Regional Waterway Strategy* is guided by medium- and long-term outcomes, ensuring that management efforts focus on areas that best support the region's vision.

This process draws on a wide range of knowledge sources, including scientific research, monitoring and assessments, expert advice, Traditional Ecological Knowledge, and insights from stakeholders and local communities.

Environmental, social, cultural and economic values were assessed, along with the multiple benefits they provide and any potential conflicts between values and outcomes.

A climate-change adaptation lens was applied to assess the feasibility of achieving desired outcomes under predicted climate conditions. In line with the approach being developed for the third *Victorian Waterway Management Strategy*, the process considered whether waterway ecosystems, biodiversity and other values can be made more resilient, and where management should instead support transition or transformation.

Stakeholders, including First Nations groups, were invited to contribute through:

1) Early discussions with Wimmera CMA, where they identified important waterways, desired outcomes, priorities, issues, opportunities and potential management actions.
2) Providing feedback on a working draft of the Strategy.
3) Additional discussions on the working draft where required.

Community members also had the opportunity to share their views through an online survey on the Wimmera CMA website.

Steps in the prioritisation process included:

1) **Confirming the region's desired outcomes.**
The 2020–21 *Wimmera Regional Catchment Strategy* established medium- and long-term desired outcomes for rivers, streams, wetlands and floodplains through extensive stakeholder and community consultation. These outcomes form the foundation of the *Regional Waterway Strategy*, ensuring strong alignment between the two strategies.

2) **Identifying waterways relevant to each outcome.**
This step involved:
   - Collating information on the environmental, social, cultural and economic values present across waterways.
   - Identifying waterways where attributes linked to each outcome occur, such as areas with high environmental, recreational or cultural values.
   - Assessing the condition or level of these values at relevant waterways.

3) **Assessing risks to values.**
Risks were assessed by examining threats to waterway values, including predicted climate-change impacts such as declining rainfall and runoff, more frequent drought periods, extreme rainfall events, and increased bushfire risk.

4) **Assessing the potential to enhance waterway values.**
This step helped prioritise waterways where actions could actively enhance values - not just reduce risks. For example, the outcome "*More waterways provide improved recreational opportunities and amenity while minimising impacts on environmental values*" focuses on increasing recreational opportunities and managing potential impacts.

5) **Evaluating the feasibility of management actions.**
Feasibility was assessed by considering factors such as climate change, cost-effectiveness, landholder and stakeholder participation, scale of intervention, effectiveness of past actions, and any barriers to achieving outcomes.

6) **Prioritising waterways as high, medium or low.**
Waterways were assigned a priority level based on where management actions would deliver the greatest benefit toward achieving desired outcomes over the Strategy's 10-year timeframe.

A separate *Implementation Plan* will outline the feasible management actions to be delivered in high-priority areas.

Priority waterways for management

The region's high priority waterways for management include the Wimmera River, MacKenzie River system, Lakes Albacutya and Hindmarsh, nationally important wetlands, and critically endangered Seasonal Herbaceous Wetlands. Together, these areas hold the highest ecological, cultural and recreational value and face the greatest management needs.

These waterways support threatened species, provide vital habitat and drought refuges, contain nationally and internationally recognised wetland systems, and hold deep cultural significance for First Nations People. Managing them well will deliver the greatest long-term benefits for habitat, connectivity, cultural values, native fish, recreation and community wellbeing.

Details of the prioritisation process to identify priority waterways for management are described in a supporting document to the Strategy.

The next section provides a summary, describing the priority waterways for management action to achieve medium-term outcomes contributing to each long-term outcome. All waterways listed are high priorities for their respective outcome, unless otherwise stated.

Long-term outcome 1 – Knowledge and experience of First Nations People is informing waterway planning, management and delivery in the Wimmera, advancing self-determination.

First Nations People hold deep knowledge and cultural connections to the Wimmera's waterways, built over thousands of years of caring for Country. Incorporating this knowledge and experience into water planning, management, and delivery ensures decisions are informed by traditional practices and cultural values, creating more sustainable and inclusive outcomes for the region.

Figure 10 shows the Medium-term outcomes that contribute to the long-term outcome (20-year).

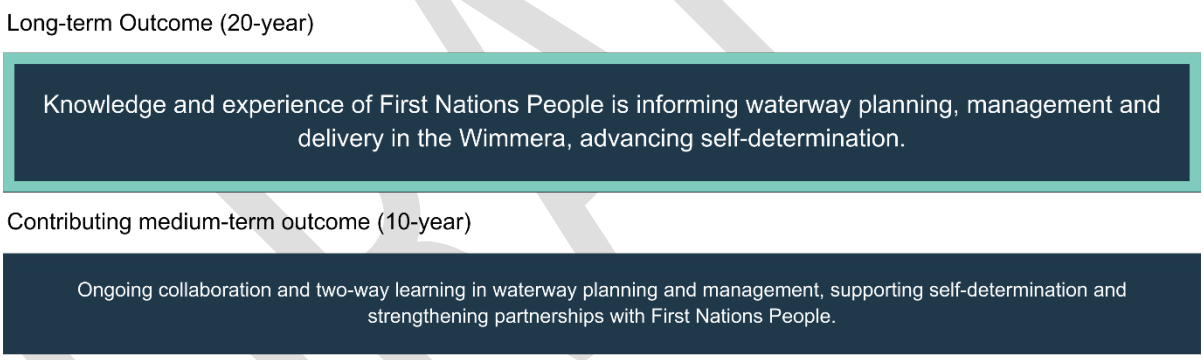


Figure 10: Medium-term outcomes (10-year) that contribute to the long-term outcome (20-year).

Priorities

Waterway planning, management and on-ground action in the Wimmera will support self-determination by fostering genuine collaboration and two-way learning with First Nations People. This approach will be applied across waterways and activities where First Nations People choose to be involved.

Long-term outcome 2 – Values and condition of waterways with formerly recognised significance are maintained or improved.

This outcome focuses on making sure waterways with formal recognition - through international agreements, national listings or state legislation - keep or improve the values that make them important. These waterways hold important environmental, cultural, social or heritage values that need ongoing protection. By directing management effort to these high-value systems, the Strategy aims to protect their recognised values, reduce key threats, and strengthen their resilience.

Figure 11Figure 11 shows the medium-term outcomes (10-year) that contribute to the long-term outcome (20-year).

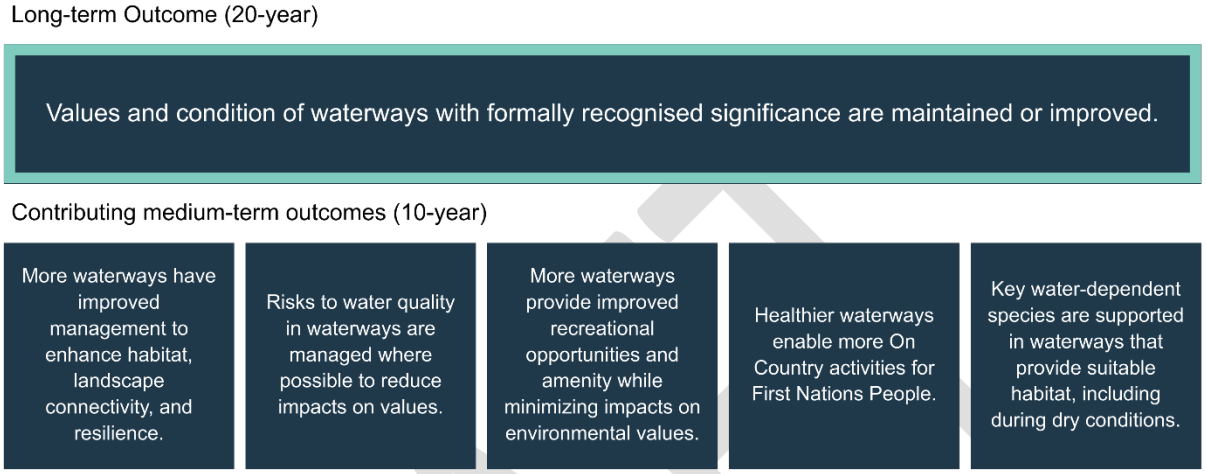


Figure 11: Medium-term outcomes (10-year) that contribute to the long-term outcome (20-year).

Priorities

Table 1 lists the priority waterways identified for management over the next 10 years to achieve medium-term outcomes that contribute to Long-Term Outcome 2.

Table 1. Priority waterways.

Local area	Priority waterways	Why they are priorities
Hindmarsh	**Lower Wimmera River**	• Victorian Heritage River listing and Flagship waterway. • Riparian vegetation corridor linking Little Desert-Wyperfeld National Parks. • High cultural, environmental and recreational value, including native fish and drought refugia. • Risks to values from lack of flow, climate change, saline groundwater intrusion, invasive species, and recreation impacts.
Hindmarsh	**Outlet Creek**	• Part of Heritage River with high cultural, environmental and recreational value. • Riparian vegetation corridor linking Lake Hindmarsh, Lake Albacutya and Wyperfeld National Parks. • Risks to values from lack of flow, climate change, invasive species, and recreation impacts.
Hindmarsh	**Lake Albacutya**	• Internationally important Ramsar wetland, nationally important wetland and part of Heritage River. • Major intermittent refuge for >20,000 waterbirds. • Supports threatened species and Eucalyptus woodlands. • Risks to values from low water availability, invasive species, fire, and inappropriate recreation.

Local area	Priority waterways	Why they are priorities
Hindmarsh	**Lake Hindmarsh**	• Nationally important wetland and part of Heritage River. • Supports thousands of birds when wet. • Risks to values from low water availability, invasive species, and recreation impacts.
Hindmarsh, Horsham and West Wimmera	**Other nationally important wetlands:** Natimuk Lake, Natimuk Creek and Lake Wyn Wyn; Oliver's Swamp (Lake); Parker/Telfer's Swamp; Saint Mary's Lake; Heard Lake; Friedman's Salt Lake; Mitre Lake; Hately Lake (Swamp); Pink Lake; Bitter Swamp; White Lake	• Nationally important wetlands. • High biodiversity and bird habitat, support threatened flora, fauna and vegetation communities. • Some support valued recreation – skiing and swimming at freshwater sites and birdwatching. • Risks to values from reduced inflows and invasive species.
Horsham, West Wimmera and Upper Catchment	**Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains**	• Critically endangered (EPBC Act). • High biodiversity. • Predominantly on private agricultural land. • Risks to values from cropping, drainage, stock grazing, dry climate.

Long-term outcome 3 – Waterways condition, connectivity and resilience is improved, providing habitat that supports native species and communities.

This outcome aims to strengthen the health, connectivity and resilience of rivers, streams, wetlands and floodplains so they can continue to support native species, ecological communities, and social, economic and cultural values. It focuses on improving habitat quality, restoring natural links between waterways, and reducing pressures such as erosion, poor water quality, flow stress and habitat fragmentation.

By building healthier, connected and more resilient waterway systems, the Strategy seeks to ensure that native species can survive, move, reproduce and adapt under changing environmental conditions, including in a drying climate and more frequent extreme events.

Figure 12Figure 12 shows the medium-term outcomes (10-year) that contribute to the long-term outcome (20-year).

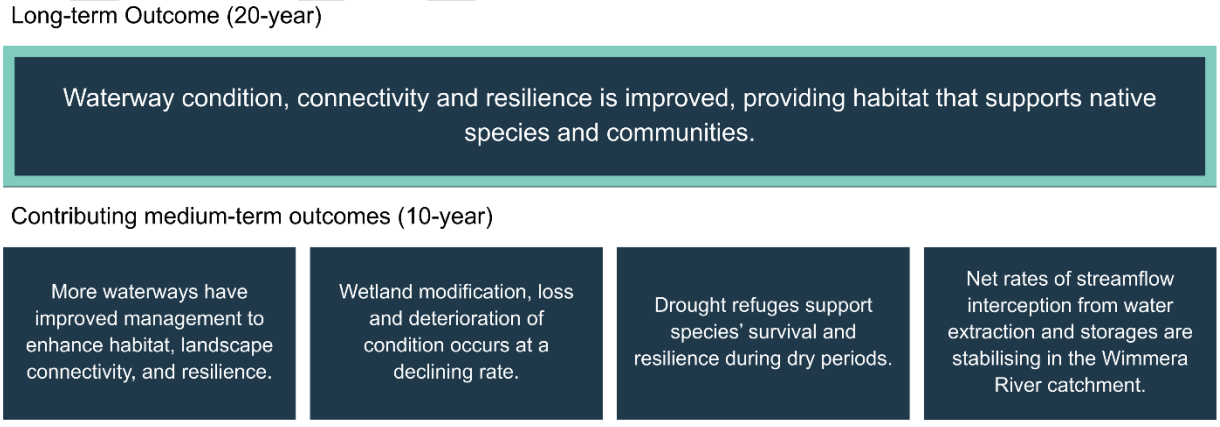


Figure 12: Medium-term outcomes (10-year) that contribute to the long-term outcome (20-year).

Priorities

Table 2 lists the priority waterways identified for management over the next 10 years to achieve medium-term outcomes that contribute to Long-Term Outcome 3.

Table 2. Priority waterways.

Local area	Priority waterways	Why they are priorities
Upper Catchment	**Upper Wimmera River and tributaries**	• Key biolink connecting the Pyrenees range with the Grampians range and mid Wimmera River. • Important catchment for water supply (Wimmera Systems Special Water Supply Catchment Area). • High erosion risk due to steep hillslopes and erodible soils. • Many unfenced riparian areas requiring protection. • Actions here reduce downstream sediment impacts on high value aquatic habitats.
Upper Catchment	**Mount William Creek and tributaries**	• Key biolink connecting the Pyrenees range with the Grampians range and mid Wimmera River. • Important catchment for water supply (Wimmera Systems Special Water Supply Catchment Area). • Variable riparian protection - stock access and erosion risk. • Opportunity to strengthen riparian condition and biodiversity fringing the Grampians National Park.
Horsham and Upper Catchment	**MacKenzie River, Burnt Creek, Bungalally Creek**	• High-quality riparian corridor linking the Grampians National Park and the mid Wimmera River. • MacKenzie River hosts the last Wimmera populations of platypus and river blackfish. • Supports other key species, including small native fish and freshwater crayfish. • Upper reaches are important for water supply (Wimmera Systems Special Water Supply Catchment Area). • Opportunity to create drought refuge pools for these species with piped water. • Risks include flow stress, climate change, invasive species and recreational vehicle impacts.
Hindmarsh	**Lower Wimmera River**	• Victorian Heritage River listing and Flagship waterway. • Riparian vegetation corridor linking Little Desert and Wyperfeld National Parks. • High cultural, environmental, social and economic value, including native fish and drought refugia. • Risks to values from lack of flow, climate change, saline groundwater intrusion, invasive species, and recreation impacts.
Horsham	**Mid Wimmera River**	• High cultural, environmental, social and economic value. • Major corridor linking the Grampians and Little Desert National Parks. • Variable condition. • Threats from stock access and weeds. • Potential future platypus restoration focus.
Yarriambiack and Buloke	**Yarriambiack and Dunmunkle Creeks (medium priority)**	• Connected vegetation through highly modified landscape. • Maintain north–south habitat routes under climate change. • Local stewardship via Landcare. • Risks include invasive species, lack of flow.

Local area	Priority waterways	Why they are priorities
West Wimmera	**South-west Wimmera wetlands**	• Dense “chains” of wetlands with high biodiversity and connectivity. • High threat from cropping, modification including drains and dams, and stock grazing – a high priority to arrest decline.
Horsham	**Horsham wetlands incl. Natimuk–Douglas Chain of Lakes**	• Multiple nationally listed wetlands. • Important saline habitat connectivity. • High bird and threatened species and communities values. • Risks include invasive species and hydrology changes.
Hindmarsh, Upper Catchment and Yarriambiack and Buloke	**Wimmera Mallee Pipeline-watered wetlands**	• Environmental water sustains diverse native flora and fauna in a highly modified agricultural landscape. • Increasingly important drought refuges under climate change.

Long-term outcome 4 – Water is of sufficient quality to support waterway values and uses at important areas for water supply, cultural, environmental and social values.

Healthy waterways are essential for sustaining the Wimmera’s environmental, cultural, social, and economic values. Achieving water of sufficient quality ensures that rivers and streams can support critical uses - such as water supply for communities, agriculture and industry - while protecting habitats, cultural heritage, and recreational opportunities.

This long-term outcome underpins the resilience of the region’s ecosystems and the wellbeing of the people who depend on them.

Figure 13Figure 13 shows the medium-term outcomes (10-year) that contribute to the long-term outcome (20-year).

Figure 13: Medium-term outcomes (10-year) that contribute to the long-term outcome (20-year).

Priorities

Table 3 lists the priority waterways identified for management over the next 10 years to achieve medium-term outcomes that contribute to Long-Term Outcome 4.

Table 3. Priority waterways.

Local area	Priority waterways	Why they are priorities
Hindmarsh	**Lower Wimmera River**	• Victorian Heritage River listing and Flagship waterway. • Riparian vegetation corridor linking Little Desert and Wyperfeld National Parks. • High cultural, environmental, social and economic value, including native fish and drought refugia. • Risks to values from poor water quality, lack of flow, climate change, saline groundwater intrusion, invasive species, and recreation impacts.
Horsham	**Mid Wimmera River**	• Supports diverse native fish and community recreation (especially Horsham weir pool) • Manage variable water quality risks under changing flow regimes.
Hindmarsh and Horsham	**Wimmera River weir pools at Horsham, Dimboola, Jeparit**	• High recreation, amenity, cultural and economic values. • High-visitation recreation nodes associated with townships. • Ongoing improvements to support access and recreation while minimising impacts on the river environment and cultural heritage.
Upper Catchment	**Lake Bellfield and catchment** **Lake Wartook and catchment** **Mount William Creek catchment**	• Provide essential urban, pipeline and environmental flow water supply (Wimmera Systems Special Water Supply Catchment Area). • High bushfire risk in Grampians National Park. • Priority to minimise bushfire risk and maintain post-fire water quality.
Upper Catchment	**Wimmera River headwaters**	• High environmental value in headwaters and downstream reaches. • Important catchment for water supply (Wimmera Systems Special Water Supply Catchment Area). • High bushfire risk in upper catchment forests. • Priority to minimise bushfire risk and maintain post-fire water quality.

Long-term outcome 5 – Waterways with high environmental, social, cultural and economic values are maintained.

The Wimmera's waterways are vital to the region, supporting rich environmental habitats, cultural heritage, recreational opportunities, and economic activity.

Maintaining waterways with high environmental, social, cultural, and economic values is essential for sustaining biodiversity, protecting cultural connections, and ensuring communities can continue to enjoy and benefit from these natural assets. This long-term outcome reflects a commitment to preserving these values for future generations.

Figure 14 shows the medium-term outcomes (10-year) that contribute to the long-term outcome (20-year).

Figure 14: Medium-term outcomes (10-year) that contribute to the long-term outcome (20-year).

Priorities

Table 4 lists the priority waterways identified for management over the next 10 years to achieve medium-term outcomes that contribute to Long-Term Outcome 5.

Table 4. Priority waterways.

Local area	Priority waterways	Why they are priorities
Hindmarsh and Horsham	**Wimmera River weir pools at Horsham, Dimboola, Jeparit**	• High recreation, amenity, cultural and economic values. • High-visitation recreation nodes associated with townships. • Ongoing improvements to support access and recreation while minimising impacts on the river environment and cultural heritage.
All	**Lakes with high social and economic value:** e.g. Taylors, Green, Toolondo, Fyans, Bellfield, Wartook, Lonsdale, Charlegrark, Wallace, Ratzcastle, Bringalbert, Marma, Watchem, Nhill.	• Region's most important sites for tourism, recreation and community wellbeing. • Some are important for water supply (Wimmera Systems Special Water Supply Catchment Area). • Some lakes lack management plans to plan and support effort to maintain and improve values (e.g. Charlegrark, Bringalbert, Marma).
All	**Native fish:** **Whole catchment; MacKenzie River and Burnt Creek**	• Maintain and expand native fish abundance and distribution. • River blackfish are a priority and are culturally significant. • MacKenzie River and Burnt Creek are key breeding and refuge areas for small-bodied native fish.
Horsham	**Platypus -** **MacKenzie River**	• Iconic threatened species. • Last remaining Wimmera population - stable but small. • Flows at risk from dry climate.
Horsham, West Wimmera and Upper Catchment	**High-environmental-value wetland groups:** South-west Wimmera; Horsham and Natimuk–Douglas chain; Upper Catchment.	• High density and diversity of wetlands with high habitat and connectivity values. • At risk from cropping, drainage, grazing, dry climate and other impacts.

Long-term outcome 6 – Wimmera people are active stewards taking action to care for waterways.

The Wimmera's waterways benefit when local people are actively involved in their care. Encouraging people to actively care for waterways fosters shared responsibility, strengthens connections to nature, and ensures lasting environmental, cultural, and social benefits.

Figure 15 shows the medium-term outcomes (10-year) that contribute to the long-term outcome (20-year).

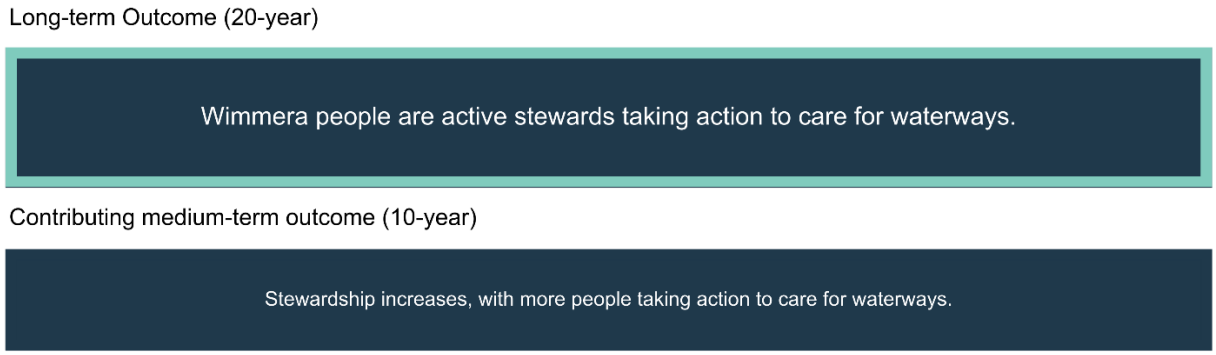


Figure 15: Medium-term outcomes (10-year) that contribute to the long-term outcome (20-year).

This long-term outcome reflects a commitment to empowering Wimmera people to take meaningful action for healthy rivers, streams, wetlands and floodplains.

Priorities

These long- and medium-term outcomes apply to stewardship across all waterways in the Wimmera.

Rowing on the Wimmera River, Horsham

CONSULTATION DRAFT

PART D

CATCHMENT-WIDE MANAGEMENT TOPICS

VICTORIA State Government Australia

Wimmera CMA

WHOLE-OF-CATCHMENT MANAGEMENT TOPICS

This section addresses key issues that affect waterways across the entire Wimmera catchment, rather than specific local areas. These topics represent broad-scale challenges and opportunities that require coordinated management to protect environmental, cultural, social, and economic values.

The section covers themes such as waterway-based recreation, water quality, fire preparedness and recovery, blue-green algae management, native fish conservation, platypus recovery, and birdlife protection. For each topic, it outlines the current context, major threats, and desired medium-term outcomes, supported by evidence and examples of ongoing initiatives.

Lake Fyans in the Upper Catchment

Waterway-based recreation

Rivers, lakes, and wetlands are central to community recreation and livability in the Wimmera. Some waterways are vital for the amenity and economy of many small regional towns. They support activities such as fishing, boating, skiing, camping, birdwatching, and sightseeing, generating millions of dollars annually in health, wellbeing, and economic benefits.

A socio-economic study estimated that water-based recreation generates up to $30 million annually for the Wimmera–Southern Mallee region. [13] This underscores the importance of collaborative management to maintain both environmental and recreational values.

However, recreational use can also create environmental risks. Unmanaged activities - such as illegal firewood collection, littering, off-road vehicle access, and vegetation removal – can lead to bank erosion, habitat loss, poor water quality and reduced amenity. Popular non-native fish species like redfin and trout impact native fish populations, while visitation can damage riparian areas and spread pest and weed species, deliberately and accidentally. Dry periods add further challenges, with empty creek beds and wetlands vulnerable to misuse.

Balancing recreation with environmental protection is a key goal of this strategy. Many community groups recognise that healthy waterways underpin recreational opportunities and actively contribute to stewardship. For example, angling clubs have partnered in projects to improve access while minimising environmental impacts and enhancing the natural environment.

Partnerships and Initiatives

Since 2016, Wimmera CMA has worked under the Victorian Government's *Our Catchments, Our Communities* framework to foster partnerships with local councils, Traditional Owners, and user groups. Key initiatives include a walking track along the Wimmera River, floating wetlands at Dimboola, weed and carp control, flow upgrades at major lakes, and a Waterway Action Plan for Green Lake.

Unmanaged recreation can cause serious environmental damage, including erosion, sedimentation, and wildlife displacement. Strategic, partnership-based planning is essential to balance community access with environmental protection. This includes monitoring land-use changes, managing rubbish collection, maintaining roads, and implementing fire and weed control.

Desired outcome

The 10-year medium-term desired outcome for waterway-based recreation is:

- **More waterways provide improved recreational opportunities and amenity while minimising impacts on environmental values.**

Australia Day event at the Wimmera River, Horsham

Water quality

Access to clean water is critical for environmental health, community wellbeing, and the Wimmera's farming and industrial sectors. Towns and farms rely on high-quality water for drinking, sanitation, stock watering, crop spraying, industry, and maintaining public spaces. Poor water quality can trigger algal blooms and fish deaths, harming ecosystems and disrupting recreation such as fishing and swimming. Freshwater species like fish, plants, and macroinvertebrates are especially vulnerable.

Grampians Headworks Storages supply water to 34 townships and about 9,000 farms across the Wimmera and Southern Mallee. This network of reservoirs, diversion weirs, and streams is protected under the *Catchment and Land Protection Act 1994* as a special water supply catchment. Maintaining water quality in these streams is essential for reliable supply and healthy ecosystems.

Runoff from farmland often carries nutrients and sediments into waterways, influenced by land management and riparian vegetation. During the Millenium Drought (2000–2010), water quality declined sharply, with salinity in the lower Wimmera River exceeding seawater levels. Water savings arising from construction of the Wimmera-Mallee Pipeline completed in 2010 saved water and enabled environmental flows to key waterways, improving water quality and supporting recovery.

Environmental water entitlements managed by Wimmera CMA continue to sustain river health - strategic flow management since 2010 has improved water quality, reconnected pools, and supported aquatic habitats. During extended dry periods with reduced natural flows - in 2014-15, 2018-21 and 2024-25 - Wimmera CMA used environmental water conservatively, directing flows to priority refuge pools to help maintain water quality and support the survival of aquatic species during drought conditions.

Some water storages and wetlands experience occasional algal blooms, and waterways often fail to meet Victoria's reference standards, or desired environmental condition, for salinity, oxygen, turbidity, and pH. Despite this, water quality generally supports native fish, recreation, and community events, supported by strategic management of environmental flows.

Key threats

The main threats to water quality in the Wimmera include:

- Saline groundwater intrusion: A major risk in the lower Wimmera River during low flows, degrading habitats and harming fish and vegetation.
- Erosion and sediment movement: Upper catchment erosion increases turbidity and smothers habitats downstream.
- Point-source pollution: Urban stormwater, septic leaks, discharge or drainage from industrial areas, and illegal chemical dumping pose low but ongoing risks, requiring vigilance and monitoring.

Desired outcome

The 10-year medium-term desired outcome for water quality is:

- **Risks to water quality in Wimmera waterways are managed where possible to reduce impacts on values.**

Interim water quality targets

This Strategy identifies waterways where interim targets are desired to address threats posed by poor water quality, and where waterway managers can feasibly make a difference to achieve the targets.

Background

The *State Environment Protection Policy (Waters) 2018* (*SEPP-Waters*) was introduced to protect and improve water quality in Victoria. Clause 18 required the development of interim regional targets for priority waterways identified in *Regional Waterway Strategies* where:

- Environmental quality objectives for surface water were unlikely to be met during the *SEPP-Waters'* lifetime.
- Poor water quality posed a threat to values.

These interim targets were intended to guide waterway managers in achieving measurable, time-bound improvements in water quality for environmental outcomes.

SEPP (Waters) is no longer a statutory instrument under the *Environment Protection Act 2017 (EPA Act)*. The *Environment Reference Standard* now sets out environmental values for water, land, air, and sound that the Victorian community seeks to achieve. *SEPP (Waters)* remains part of the 'state of knowledge', meaning the EPA may still use Clause 18 to inform its actions and expectations for water quality protection under the EPA Act, *Environment Reference Standard*, regulations, and guidance (EPA, 2021). [24]

Interim water quality targets can help businesses, agencies, and individuals understand their responsibilities to prevent harm from poor water quality. A key principle of the EPA Act is that decisions must be based on the best available, relevant, and reliable information about risks of harm and practicable ways to minimise them. This evolving 'state of knowledge'-drawn from reputable sources such as research institutions, government agencies, and industry bodies-underpins the *General Environmental Duty*, which applies to all Victorians. *General Environmental Duty* requires everyone to reduce risks of harm to human health and the environment from pollution and waste.

Considerations

Analysis of monitoring data indicates that many areas across the Wimmera are not consistently meeting *Environment Reference Standard* or *SEPP (Waters)* environmental quality objectives.

Although *SEPP (Waters)* is no longer in force, the draft *Victorian Waterway Management Strategy* (in development) recommends using the *Environment Reference Standard* to guide water quality targets in *Regional Waterway Strategies* where sufficient monitoring data exists.

Waterways for interim water quality targets

This Strategy identifies waterways where interim water quality targets are desirable and outlines outcomes and actions - in its Implementation Plan - to address threats to water quality. Monitoring date is available near all sites from permanent gauges, supplemented by monitoring by Wimmera CMA staff for the Horsham and Dimboola sites.

Proposed sites for setting interim water quality targets are on the Wimmera River are detailed in Table 5. Interim water quality targets will be set by 2030.

Works completed in an Upper Catchment waterway to reduce sediment movement and impacts downstream.

Table 5. Priority sites for interim water quality targets.

Location	Waterway type	Pollutants of concern and their main sources	Broad types of activities that can reduce impacts
Wimmera River at Glenorchy	Rural	Sediment and nutrients from erosion in up-stream tributaries.	Actions to minimise erosion and sediment/nutrient transport from upstream tributaries, including: • Riparian protection. • Structures to reduce highly eroding sites. • Supporting landholders to maintain groundcover on neighbouring paddocks, via education and research activities.
Wimmera River at Horsham weir pool	Urban	Urban stormwater runoff. Sediment and nutrients from erosion in up-stream tributaries.	Actions to minimise erosion and sediment/nutrient transport from upstream tributaries (as above). Monitoring point source pollution from industrial areas and new industry, and acting where necessary. Water sensitive urban design to minimise impacts from urban stormwater runoff.
Wimmera River at Dimboola weir pool	Rural	Urban stormwater runoff. Sediment and nutrients from erosion in up-stream tributaries. Saline groundwater intrusion upstream at Wail.	Actions to minimise erosion and sediment/nutrient transport from upstream tributaries (as above). Monitoring point source pollution from industrial areas and acting where necessary. Water sensitive urban design to minimise impacts from urban stormwater runoff.

Next Steps

The interim water quality targets will be developed in a management plan as part of an interim target setting process. In addition to setting targets, the management plan will list all partner and stakeholder activities that will directly address the drivers of poor water quality and other environmental influences associated with the risks to values.

Target development will consider factors including:

- Ecological values and water quality processes to set realistic targets.
- Feasible actions and resources to achieve targets.
- Priority of the site and significance of reducing ecological risks.
- Future land-use and climate change impacts. [25]

Progress on interim targets will be tracked through Monitoring, Evaluation, Reporting and Improvement processes.

Fire preparedness, response and recovery

Evidence shows that climate change is increasing the severity, frequency and geographic extent of fires in Victoria. [26] Fire regimes appear to be changing in the Wimmera's key water catchments in the Wimmera Systems Special Water Supply Catchment Area.

Waterways can experience declines in water quality, water yield and ecosystem health following catchment bushfires. Bushfires remove ground cover, increasing the risk of erosion and runoff during post-fire rainfall events, delivering higher loads of sediment and nutrients to rivers and streams. This influx can reduce water clarity, alter habitat, and disrupt aquatic ecosystems. Decomposing organic material may also cause shortterm drops in dissolved oxygen, stressing or killing aquatic life. Elevated nitrogen and phosphorus levels from burned soils can further trigger harmful algal blooms, compounding water quality degradation and ecological impacts. In some forest types, postfire regeneration can also reduce water yields, further stressing water supplies.

Lake Bellfield, for example, experienced water-quality issues following the 2006 Grampians National Park fires and the 2010-11 floods. Considerable investment was needed to address these problems so the lake could continue supplying water to the Wimmera Mallee Pipeline and Lake Fyans.

The 2024 Bayindeen fire burnt a large area of the Mount Cole State Forest within the Wimmera catchment. Fortunately, only light rainfall occurred in the months that followed. Heavy rain would likely have washed large amounts of soot and sediment into waterways, threatening aquatic life in the upper Wimmera River and degrading water quality downstream, including in the Jeparit, Dimboola and Horsham weir pools—putting at risk their environmental, social, cultural and

economic values. In response, GWMWater undertook substantial sediment-control measures to protect Mount Cole Reservoir, which supplies water to Ararat.

Victorian Catchment Management Authorities, supported by fire authorities and experts, have acknowledged that both the direct and indirect impacts of fire require a coordinated, whole-of-government and community approach to prevention, response and recovery.

Fire authorities recognise the need to adapt management practices to prevent the risks posed by large fires and changes to fire behaviour influenced by climate change. This approach will need to balance a range of priorities including the protection of life and property.

Blue-green algae

Blue-green algae (cyanobacteria) are naturally occurring, but blooms can develop when conditions become unbalanced - typically due to nutrient runoff, warm temperatures, sunlight, and still water. These outbreaks can produce harmful toxins, posing risks to human health, aquatic life, and recreation, with significant social and economic impacts.

Blooms occur most often in summer and can persist into cooler months, leading to extended closures of lakes and rivers. This affects popular recreation sites such as Lake Wallace, Lake Charlegrark, Green Lake, Dock Lake, Lake Lonsdale, and Yarriambiack Creek weir pool. Sections of the Wimmera River are also vulnerable during drought, though managed environmental flows help reduce risk.

GWMWater coordinates monitoring and response under the *Regional Blue-Green Algae Coordination Plan*, working with councils, Parks Victoria, and DEECA to protect public health and minimise impacts. The plan outlines roles, responsibilities, and response protocols for local and regional outbreaks.

Climate change is expected to increase bloom frequency due to higher temperatures, reduced flows, and more extreme weather. While products such as aerators, ultrasonic devices, floating wetlands, and clay treatments exist, most are costly, short-term, or unsuitable for the large lakes at risk of blue-green algae outbreaks in the Wimmera. Chemical treatments can harm ecosystems.

Long-term solutions require continued research, stakeholder collaboration, and integrated catchment planning to maintain water quality for supply, environmental health, and recreation

Drought refuge pools

Climate change modelling for the Wimmera indicates that the region is likely to experience declining rainfall, reduced runoff to waterways, lower environmental water availability, and increased temperatures and evaporation. These changes are expected to result in less frequent and lower-volume flows in rivers and wetlands, on average, with variability. [15; 19]

Maintaining and establishing drought refuges at sites with high environmental values is a key precautionary measure designed to help the Wimmera's water-dependent species and ecosystems cope with drought and a drying climate.

Maintaining drought refuges

Wimmera CMA is assessing the benefits, costs and feasibility of maintaining drought refuges in high-priority areas to help retain environmental values during drought and a changing climate. This work includes exploring opportunities to deliver environmental water directly to refuge sites using the region's extensive water-supply pipeline network.

Delivering environmental water directly to these refuges via pipeline infrastructure offers several important benefits:

- Maintaining habitat and supporting water-dependent species and ecosystems during dry periods.
- Sustaining source populations that can recolonise waterways when wetter conditions return.
- Preventing local extinctions of threatened and vulnerable species, such as platypus (*Ornithorhynchus anatinus*), river blackfish (*Gadopsis marmoratus*), western swamp crayfish (*Gramastacus insolitus*) and Glenelg spiny crayfish (*Euastacus bispinosus*).
- Enabling more efficient use of environmental water by directing limited supplies to locations where it will have the greatest benefit.
- Ensuring water can reach sites that would not otherwise receive flows during periods of low natural flow or limited environmental water allocations.

Using pipelines for watering is more expensive. The approach requires upfront investment to install the necessary infrastructure and involves ongoing water delivery costs.

The intent is for water to be delivered through pipelines on an as-needs basis to respond to the ecological needs of species and the waterway system while minimising costs. For example, scenarios where it would be preferable to deliver water to refuges via pipelines are likely to include:

- When the environmental values of refuge pools are at risk due to a lack of flow during dry years when natural flows and available environmental water are insufficient.
- To prevent impacts on overall water supply. For example, preventing Lake Wartook from reaching "critical supply limits" - where supply for human use takes priority and there is no environmental water available for release.

Further investigation and adaptive management are required to assess the long-term feasibility of this initiative and ensure that efficient and effective drought refuge management can achieve desired outcomes.

If the Wimmera experiences significant climate change in the future - such as modelled high or worst-case scenarios - many waterways may shift toward systems with much lower annual average streamflow. They would function more often as "chains of ponds," connecting only for reduced periods, during major rainfall or storm events, or when environmental flows are delivered. In this situation, particularly during extended, severe dry conditions these sites may no longer act as reliable drought refuges, sustaining a range of species until wet conditions return. Instead, they may become the only remaining viable aquatic habitats in an increasingly dry landscape, where other refuge pools have dried out or are too small to support many species.

There remains considerable uncertainty about if, when and how these changes will unfold, how extensive they might be, and whether the modelled increased likelihood of large summer storm events will be sufficient to maintain aquatic ecosystems, secure environmental water supplies and allow carry-over of environmental water for future dry years. Research and adaptive management will be essential to help these systems adjust over time and inform future management approaches.

Given this uncertainty, adopting a precautionary approach will be important to support ecosystem resilience, guide transition to new conditions, and protect waterway features valued by the community and First Nations People. Maintaining drought-refuge pools is a key part of this precautionary approach.

Assessing feasibility

Feasibility investigations will be important when establishing drought-refuge sites. These assessments help ensure that investment in drought-refuge management can viably support long-term desired outcomes. Feasibility considerations may include:

- Cost–benefit analysis.
- Likelihood of continuing to support waterway values under climate-change scenarios.
- Whether environmental watering at drought-refuge sites is likely to sustain target species and ecological values given modelling of future streamflow projections.

Complementary measures

Management measures will be required at drought-refuge sites to complement environmental watering and support aquatic species, ecosystems, and other important site values such as cultural heritage. For example, complementary actions may be needed to maintain site integrity and reduce risks associated with stock access, water extraction for stock and domestic use, invasive species including carp, and recreational pressure such as fishing. Threats and management measures should be managed on a site-by-site basis.

Site-specific management plans should aim for a holistic approach to drought-refuge management, ensuring environmental water is supported by broader protective actions.

Lower Wimmera River

Because the Wimmera region is already experiencing the effects of a drying climate, Wimmera CMA has progressed planning for four drought refuge pools in the lower Wimmera River. Infrastructure to connect these pools to the Wimmera Mallee Pipeline is scheduled for completion in 2026-27.

The lower Wimmera River is a high-priority waterway under this Strategy due to its Victorian Heritage River status and significant environmental, social, economic and cultural values. These values are threatened by the river's high vulnerability to reduced flows and declining water quality.

The river relies heavily on catchment runoff and flows from the upper catchment and Grampians streams to reach its lower sections. When flows diminish or cease, saline groundwater can intrude into the river channel, reducing water quality and posing risks to aquatic life, including native fish and riparian vegetation.

Environmental releases help maintain water quality and aquatic habitat when sufficient water is available. To reach the lower sections of the Wimmera River, these releases must travel from Taylors Lake or Lake Lonsdale - upstream of Horsham - through the full length of the river. This journey requires large volumes of water, which may not be available

during dry periods. In dry conditions, evaporation and infiltration further increase the volume needed to deliver water over this distance.

Piping water directly to the designated drought-refuge pools allows water to be supplied to maintain aquatic life during extreme dry conditions, using significantly less water and providing support for critical habitats when flows are absent.

Mount Cole Creek

Construction of the East Grampians Rural Pipeline in 2026, supplying stock and domestic water to parts of the Upper Catchment, has created a new opportunity to provide water to drought-refuge pools in flow-stressed Mount Cole Creek.

Infrastructure to enable piped water delivery to these refuges during dry periods is scheduled for installation in 2026. This will help key aquatic species persist through extended dry conditions, including western swamp crayfish, obscure galaxias (*Galaxias oliros*), southern pygmy perch (*Nannoperca australis*), and flatheaded gudgeon (*Philypnodon grandiceps*). [27; 28]

Potential future drought refuges

Wimmera CMA is investigating high-priority drought refuge areas in the MacKenzie River and Burnt Creek. This includes assessing the feasibility, costs and benefits of delivering piped water to support these sites during extreme dry conditions.

The MacKenzie River and Burnt Creek are high-value waterways that support environmental assets, including remnant populations of Wimmera platypus and river blackfish and diverse small-bodied native fish communities that are otherwise rare and have limited distribution elsewhere in the region. These waterways also contain threatened species such as the western swamp crayfish and Glenelg spiny crayfish.

Both waterways are vulnerable to reduced flows during drought and under a changing climate, placing some of their ecological values at increasing risk.

Water transfers from Lake Wartook supplement flows in the upper MacKenzie River, transporting water supply for Horsham, Natimuk and surrounding agricultural areas. Moora Moora Reservoir supplies water to Brimpaen storage for the surrounding agricultural areas. GWMWater can transfer water from both Lake Wartook and Moora Moora Reservoir to Taylors Lake via Upper Burnt Creek when storages have adequate water levels.

Lake Wartook, located in the Grampians, is a key component of the region's urban and agricultural water supply. Although historically reliable, largely due to its ability to refill quickly after major rainfall events, Lake Wartook is vulnerable to climate change-driven reductions in runoff and higher evaporation rates. During prolonged dry periods, meeting critical human water needs takes priority, increasing the risk of reduced flows and environmental stress in the MacKenzie River and Burnt Creek.

Because these waterways form an essential part of the regional water supply network, they are likely to continue receiving some level of flow that sustains aquatic habitat. However, transitions in waterway values remain possible if climate-related declines in flow are substantial.Wimmera CMA is exploring whether new drought-refuge infrastructure, supported by pipeline supply, could help protect these high-value ecosystems when natural flows and environmental water are insufficient. Stakeholders including GWMWater, DEECA, VEWH and Wimmera CMA are also examining broader options for Lake Wartook such as infrastructure upgrades to improve efficiency, as well as informing updates to key policy documents, such as the *Western Region Sustainable Water Strategy*, to reflect current and emerging water security challenges.

Wimmera CMA will also work with stakeholders regarding future proposals for new water supply pipelines in the region - to investigate viable opportunities to support ecological values at high priority sites by maintaining drought refuge areas in the pipeline footprint during dry conditions.

Aquatic ecosystems and species

Wimmera waterways support interconnected systems made up of plants, animals, and ecological processes that depend on one another. Every aquatic animal - from fish, birds and mammals to insects, mussels and crayfish, along with aquatic and bank vegetation - plays an essential role in maintaining the health, function and resilience of these ecosystems.

First Nations People have long understood and articulated this interconnectedness. Their knowledge teaches that all elements of Country - water, land, plants, animals, and people - are part of a single living system, where the wellbeing of each species contributes to the wellbeing of the whole.

Within this broader context, many of the Strategy's desired outcomes focus on improving waterway health and habitat to support the wide range of species and ecosystems that rely on Wimmera waterways. While this holistic approach is central to the Strategy, some species are prioritised for more targeted action over the 10-year Strategy, particularly threatened or culturally significant native species - such as platypus and river blackfish - that were once widespread but are now at risk of local extinction. This also includes culturally significant species such as freshwater mussels, crayfish, and birdlife, and species valued by the Wimmera community, such as native fish, where it is considered possible to make a meaningful difference to their populations or where further information is needed to guide effective management.

Wimmera fish

Native fish are vital to the Wimmera's aquatic ecosystems and cultural heritage. Wimmera waterways are inhabited by a variety of freshwater fish, including:

- Medium to large-bodied native fish including river blackfish (*Gadopsis marmoratus*).
- Small-bodied native fish including southern pygmy perch (*Nannoperca australis),* obscure galaxias (*Galaxias oliros),* flat-headed gudgeon (*Philypnodon grandiceps)*, Australian smelt (*Retropinna semoni*), and carp gudgeon *(Hypseleotris spc*).
- Native species thought to be introduced to the Wimmera such as golden perch *(Macquaria ambigua)*, silver perch *(Bidyanus bidyanus*), eel-tailed catfish *(Tandanus tandanus)*, and Murray cod (*Maccullochella peelii).*
- Introduced non-native species such as brown trout (*Salmo trutta*), redfin perch (*Perca fluviatilis*), carp *(Cyprinus carpio)*, mosquito fish *(Gambusia holbrooki)*, tench (*Tinca tinca*) and goldfish.

There is a long history of stocking native fish in Wimmera waterways, mainly to enhance recreational fishing opportunities. Golden perch, silver perch, freshwater catfish and Murray cod have all been stocked into the Wimmera River. Only freshwater catfish are thought to maintain a self-sustaining population there. Golden perch and other species are also regularly stocked into recreational lakes such as Taylors Lake and the Yarriambiack Creek's weir pools. In addition, brown trout have been stocked into some recreational lakes including Lake Wartook and Lake Natimuk.

The region's waterways also support common yabbies *(Cherax destructor),* floodplain mussels *(Velesunio ambiguous)* and threatened western swamp crayfish (*Gramastacus insolitus)* and Glenelg spiny crayfish (*Euastacus bispinosus*).

Threats and impacts

The *Wimmera Native Fish Management Plan* developed in 2022 identifies major threats to native fish populations in the region as declining stream flows, reduced connectivity, impacts of invasive species and habitat loss. The plan notes that major loss of aquatic biodiversity occurred during the Millennium Drought, from around 1997 until 2010, when several species disappeared from large parts of their range.

Despite this decline, the plan notes that enhancements in waterway condition since the Millenium Drought through riparian protection works and environmental watering provide an opportunity to reverse native fish decline and achieve sustainable improvements in local fish populations. (29)

River blackfish

River blackfish (*Gadopsis marmorata*), known as Wirrap by First Nations People, were once widespread but declined sharply during the Millennium Drought, surviving mainly in the MacKenzie River. Today, restoring and expanding blackfish populations is a high-priority environmental goal.

First Nations People have acknowledged the cultural significance and importance of fish in the Wimmera. Barengi Gadjin Land Council (BGLC) partners Wimmera CMA in native-fish conservation and recovery efforts. In a support statement for Wimmera CMA's Blackfish Recovery Project, BGLC staff noted: *"Wirrap (blackfish) are an integral part of the history and culture of Wotjobaluk people and Barengi Gadjin Land Council considers the survival and expansion of this species of vital importance. We have seen first-hand, as partners in Wirrap recovery efforts in the Wimmera's upper catchment, the fragility of this species and why there is need for human intervention to secure its survival. We fully endorse Victorian State Government-led captive-breeding efforts and allied spin-off species-recovery projects involving Wirrap and maintain a desire to continue our hands-on involvement in the project."* (30)

Wimmera CMA, in partnership with BGLC, research agencies, and community groups, is leading recovery efforts through translocation, captive breeding, and habitat improvement. These actions aim to secure blackfish survival and enhance aquatic biodiversity, benefiting other native species such as southern pygmy perch, obscure galaxias, and threatened crayfish.

Environmental watering programs, riparian restoration, and invasive species control are critical to maintaining healthy habitats and water quality. These measures not only protect fish populations but also support recreational fishing and tourism, which contribute millions annually to the regional economy. Community stewardship and cultural partnerships strengthen these efforts, ensuring that environmental, social, and economic values are achieved together.

Endangered River Blackfish

Native fish breeding

Environmental water releases in the Wimmera aim to maintain and enhance the health of aquatic ecosystems by improving water quality and providing habitat for a range of native water-dependent plants and animals. This includes supporting suitable feeding, breeding and nursery habitat for native fish, particularly species that naturally occur in the region such as river blackfish, southern pygmy perch, and obscure galaxias.

In November 2021, Wimmera CMA staff observed spawning behaviour in golden perch and silver perch in the Wimmera River below the Horsham weir - an unusual event as, unlike freshwater catfish, these species are not known to breed in this system. The behaviour coincided with several days of increased flows following spring rainfall.

To replicate the flow conditions thought to trigger native fish breeding, environmental water was released in November 2023 and 2024 under the Victorian Environmental Water Holder's annual seasonal watering plans. These flows were designed using the conditions observed in 2021 and guided by the *Wimmera Native Fish Management Plan*. [29]

Although no spawning was detected during the 2023 and 2024 flows, Wimmera CMA and stakeholders remain interested in further testing and refining this approach when conditions are favourable. The aim is to improve aquatic habitat and breeding conditions for small-bodied native fish, while also providing potential benefits for larger-bodied species, such as golden perch and freshwater catfish.

Successful spawning relies on the right environmental conditions and is strongly influenced by climate factors such as rainfall and temperature. Future implementation will depend on water availability, the capacity to meet other environmental watering outcomes, and environmental conditions like water temperature. Any future releases will be planned through the Victorian Environmental Water Holder's annual seasonal watering planning process, in consultation with regional stakeholders.

This work aligns with the priorities of both the *Wimmera Native Fish Management Plan* and the Wimmera River's environmental water management plan, which aim to improve the resilience and diversity of native fish populations in the Wimmera. [22]

Removing invasive Carp from Burnt Creek

Introduced fish

The Wimmera has become home to a variety of introduced fish species. Introduced fish include native species outside their normal range, many with an extensive stocking history and value for recreational fishing, such as golden perch, silver perch, freshwater catfish and Murray cod. Anglers also value introduced non-native species, trout and redfin perch, with trout being stocked into various Wimmera recreational lakes.

Introduced non-native fish species including carp, gambusia, tench, goldfish, trout and redfin, are known to impact native species. They threaten native fish and aquatic ecosystems by breeding rapidly, outcompeting native species for food and habitat, and preying on eggs. Carp, first recorded in the Wimmera River in the 1970s, increase turbidity, damage vegetation, and worsen algal blooms. Under the Victorian *Fisheries Act 1995*, carp and gambusia are declared noxious aquatic species and they must not be returned to the water if caught.

Under this Strategy, introduced fish species will be monitored and managed in priority areas to protect valued waterway assets and guide future management actions. This includes guiding actions to support river blackfish populations in places where introduced fish such as trout pose a threat, and supporting targeted carp management in high-priority waterways.

Desired outcome

The 10-year medium-term desired outcome for Wimmera fish is:

- **Key water-dependent species are supported in waterways that provide suitable habitat, including during dry conditions.**

Birdlife and Wimmera Waterways

Wimmera waterways provide critical habitat for waterbirds and shorebirds, attracting large numbers during seasonal wetting and drying cycles and after floods. Many species are threatened or migratory, protected under international agreements such as the *Japan-Australia Migratory Bird Agreement*, *China-Australia Migratory Bird Agreement,* and *Republic of Korea-Australia Migratory Bird Agreement*. These include Palaearctic migrants like red-necked stints (*Calidris ruficollis*) and sharp-tailed sandpipers (*Calidris acuminata*), which travel from the northern hemisphere.

Birds move across the landscape to where water is present and waterway conditions are suitable, with the partial filling of Lake Hindmarsh in 2022 a prime example. Notable species include endangered freckled duck, blue-billed duck, Australasian shoveler, and brolga, alongside abundant species such as grey teal, black swan, pelican, and cormorants.

River and wetland riparian areas are equally important, offering nesting hollows, dense cover, and food sources for honeyeaters, wrens, robins, parrots, and cockatoos - including the EPBC-listed red-tailed black cockatoo and vulnerable regent parrot. These areas also support diverse insects and invertebrates, attracting raptors, kookaburras, and other predators.

Priority habitats include the Wimmera River system, Lake Hindmarsh, Lake Albacutya, the Natimuk-Douglas Chain of Lakes, ephemeral wetlands in the south-west, some large lakes, and headworks storages.

Threats include habitat loss, reduced water availability, invasive species, altered fire regimes, disease, and climate change. Wetland degradation particularly threatens migratory species. Emerging risks such as avian influenza (H5N1) could have severe impacts if introduced to Australia.

Australian darter - Lake Lonsdale

Platypus

The platypus, listed as Vulnerable in Victoria, has a long cultural connection with Wimmera communities, including First Nations People. The population is critically small – estimated at around 25 individuals - with low genetic diversity and confined to about 15 km of the MacKenzie River in the Grampians National Park. Once widespread across the Wimmera River and tributaries, numbers collapsed during the Millennium Drought due to drying waterways.

Monitoring and eDNA surveys confirm the species persists in the MacKenzie River, with some juvenile captures between 2022 and 2025 offering hope for recovery. Occasional anecdotal sightings in waterways including the Wimmera River, Mount Cole Creek and lower MacKenzie River remain unverified.

Figure 16Figure 16Figure 16 shows the known location of platypus in the Wimmera in 2025.

Actions to care for platypus in the MacKenzie River - such as environmental flows and riparian restoration - will also benefit other threatened species including the Glenelg spiny crayfish (*Euastacus bispinosus*), river blackfish (*Gadopsis marmoratus*), southern pygmy perch (*Nannoperca australis*), western swamp crayfish (*Gramastacus insolitus*) and obscure galaxias (*Galaxias oliros*).

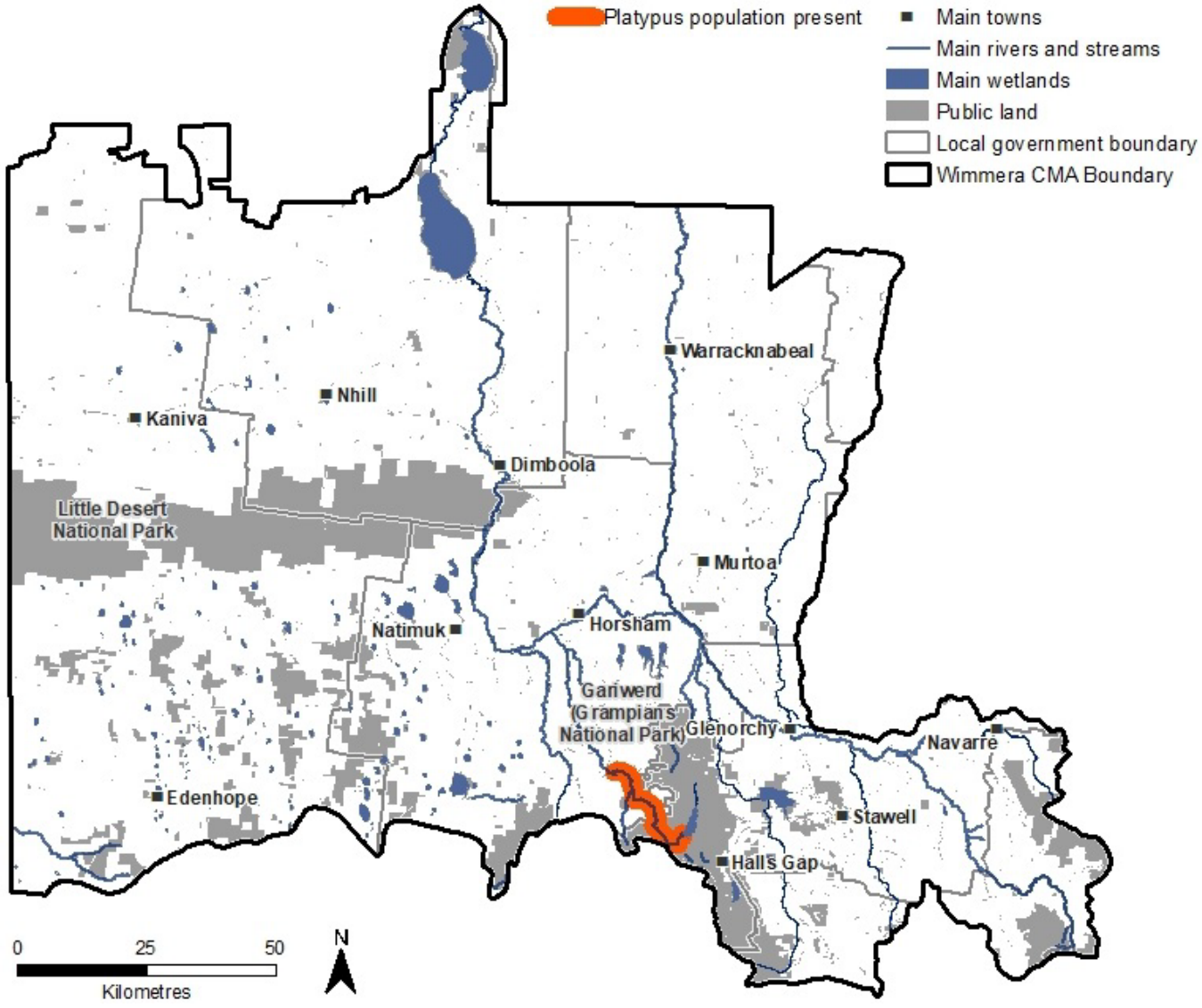


Figure 16. Platypus population in the Wimmera.

Threats

Platypus decline in the Wimmera is driven by reduced surface water, vegetation clearing, water extraction, and degraded habitat. The main threats include:

- Low water availability from reduced rainfall and rising demand.
- Fox predation
- Illegal yabby traps
- Littering
- Altered flow regimes in highly regulated waterways.
- Barriers such as weirs and dams restricting movement.
- Population viability due to small numbers and low genetic diversity.
- Bushfire risk, which can degrade water quality through sediment and ash runoff.

Desired outcome

The 10-year medium-term desired outcome for platypus is:

- **Key water-dependent species are supported in waterways that provide suitable habitat, including during dry conditions.**

During 2025, Wimmera CMA secured funding to explore potential issues and barriers preventing or limiting platypus expansion, propose management actions to overcome identified issues, and develop an evidence-based management plan to conserve platypus in the Wimmera. The management plan's focus will be on building platypus population resilience and viability.

Habitat assessment and improvement is occurring to improve the quality of riparian areas, stream banks, floodplains and aquatic habitats in urban rivers surrounding Horsham.

Monitoring platypus in the MacKenzie River

CONSULTATION DRAFT

PART E

IMPLEMENTATION, MONITORING & REVIEW

VICTORIA State Government Australia

Wimmera CMA

IMPLEMENTATION

The Strategy will be delivered through a 10-year Implementation Plan (the Plan) that translates the strategic priorities, identified through this document, into practical actions.

The Plan will identify specific actions to be taken to progress towards achieving the Strategy's outcomes. Actions will focus on the high priority waterways identified in this Strategy for each outcome.

A key element of the Implementation Plan will include programs of management actions designed to achieve outcomes.

Programs of action will be organised around the priority waterways in each local area. Whole-of-catchment management actions will be identified for achieving outcomes that do not reside in a local area or require a regional approach.

Programs of action will identify:

- On-ground actions. For example, fencing to exclude stock from riparian areas, revegetating areas to improve habitat, other habitat restoration works, erosion control works, water quality improvement, and cultural heritage projects.
- Other actions including monitoring, assessments and investigations.
- Amount of effort required to achieve outcomes with expected funding.
- Roles and responsibilities - organisations and groups with lead responsibility for implementing the management actions as well as partnerships - collaborative delivery with First Nations People, local communities, agencies, and landholders.
- Connections with other plans or strategies such as Regional Catchment Strategies, Environmental Water Management Plans, Waterway Action Plans and Country Plans.
- Monitoring and adaptive management needs. A separate *Monitoring, Evaluation, Reporting and Improvement Plan* will provide a framework for tracking progress and adapting actions to changing conditions such as climate impacts.
- Investment guidance. Directs government and partner funding to priority projects and locations.

The Plan will identify management action's that are expected to be achievable assuming continuation of current or expected funding. It will also identify priority management actions the region could implement if additional funding and resourcing became available.

The Implementation Plan will be reviewed and updated regularly to ensure it remains current and responsive to changing conditions.

PARTNERS

The *Wimmera Waterway Strategy* is being developed and will be implemented by waterway managers, in partnership with First Nations People, local communities, private landholders, relevant statewide and regional agencies and boards and other key stakeholders. (2) The Strategy and its Implementation Plan include priorities for management actions to be delivered by a range of partners and stakeholders, including First Nations People, local government, GWMWater and public land managers.

Table 6 identifies waterway strategy development and implementation partners and their core roles and responsibilities of relevance to the *Wimmera Waterway Strategy*.

The responsibilities of individual organisations in implementing the Strategy will be further articulated through collaborative development of a detailed implementation plan. This approach is based on the principle of delivering efficient and effective services and reducing duplication.

Table 6: Wimmera Waterway Strategy development and implementation partners.

	Partners	Waterway roles, responsibilities and interests
First Nations Community Partners	Registered Aboriginal Parties: Barengi Gadjin Land Council Eastern Maar Aboriginal Corporation	Local First Nations communities have a deep connection with waters and waterways. They are essential to Spiritual and Cultural practices, as well as environmental management, food production, language and (Lore) law. Water connects People and communities to land, and to each other. (31) Barengi Gadjin Land Council Aboriginal Corporation and Eastern Maar Aboriginal Corporation are Traditional Owner Groups legally recognised under the *Aboriginal Heritage Act 2006*, with responsibilities for managing and protecting Aboriginal Cultural Heritage on Country that overlaps with specific areas of the Wimmera CMA region, including waterways. Barengi Gadjin Land Council Aboriginal Corporation represents Traditional Owners from the Wotjobaluk, Jaadwa, Jadawadjali, Wergaia and Jupagulk Peoples of the Wotjobaluk Nations, who were recognised in a 2005 Native Title Consent Determination, the first in south-eastern Australia. Eastern Maar Aboriginal Corporation represents the Eastern Maar People of south-west Victoria and manages their rights and interests.
Federal Government Agencies and Statutory Authorities	Murray-Darling Basin Authority	The Murray-Darling Basin Authority was established under the federal *Water Act 2007* as an independent, expertise based statutory agency. The Wimmera Basin is a southern section of the greater Murray-Darling Basin. The primary roles of the Authority as outlined in *the Water Act 2007 (Cth)* include: • Preparing and reviewing the *Murray-Darling Basin Plan (Basin Plan).* • Measuring, monitoring, and recording the quality and quantity of the Basin's Water resources. • Supporting, encouraging, and conducting research and investigations about the Basin's water resources. • Developing equitable and sustainable use of Basin water resources. • Disseminating information about the Basin's water resources. The *Wimmera Waterway Strategy* complements and informs the Wimmera's contribution to the Murray-Darling *Basin Plan* and contributes to meeting Victoria's obligation under the *Basin Plan*.
	Department of Climate Change, Energy, the Environment and Water (DCCEEW)	Key responsibilities of the Australian Government include: • Designating Australian sites for addition to the List of Wetlands of International Importance *(Ramsar List)*

	Partners	Waterway roles, responsibilities and interests
		• Leading the development of national guidance and approaches on implementing the Ramsar Convention in Australia • Participating in partnerships and agreements that seek to protect migratory species and their flyways. • Working with state and territory governments to promote the conservation of Ramsar sites and wise use of all wetlands, and review Ramsar wetland site condition. • Collaborating with the Australian Government Department of Agriculture, Fisheries and Forestry to develop, implement and conserve marine ecosystems and biodiversity while maintaining a profitable, competitive and sustainable fishing industry. The Wimmera includes the Lake Albacutya Ramsar Site and contains waterways visited by migratory species.
	Commonwealth Environmental Water Holder (CEWH)	The CEWH is appointed under the Commonwealth *Water Act 2007* to manage the Commonwealth's environmental water holdings and protect and improve the environmental assets of the Murray-Darling Basin. The Commonwealth Environmental Water Holder: • Makes decisions about the use of Commonwealth water holdings, including providing water to the VEWH for use in Victoria. • Liaises with the VEWH to ensure co-ordinated use of environmental water in Victoria. • Reports on management of Commonwealth water holdings. In the Wimmera, the CEWH is an environmental water holder of an entitlement for the Wimmera River.
State Government Agencies and Statutory Bodies	Catchment Management Authorities (CMA)	The Wimmera CMA, along with nine other CMAs, was established in 1997 by the Victorian Government, under the *Catchment and Land Protection Act 1994*, with the aim of creating a whole of catchment approach to natural resource management in the state. The primary goal of Victorian CMAs is to ensure the protection and restoration of land and water resources, the sustainable development of natural resources-based industries and the conservation of natural and cultural heritage. Under Part 10 of the *Water Act 1989,* CMAs are designated with specific responsibility for the management of waterways, drainage and floodplains. The range of functions that CMAs undertake include: • Developing a *Regional Waterway Strategy* and associated action plans. • Developing and implementing work programs. • Authorising works on waterways, and acting as a referral body for planning applications, licences to take and use

	Partners	Waterway roles, responsibilities and interests
		water and construct dams, for water use and other waterway health issues. • Identifying regional priorities for environmental watering and facilitating water delivery. • Providing input into water allocation processes. • Developing and co-ordinating regional floodplain management plans.
	Department of Environment, Energy and Climate Change (DEECA)	DEECA is a Victorian Government department that develops and implements statewide policy for waterway management, including environmental water, and water resource allocation and oversees Victoria's compliance with international and national water obligations and intergovernmental agreements, for example the *Murray-Darling Basin Plan*, *Living Murray*, and *Ramsar Convention* for wetlands. The department also develops and implements related policy and programs for Crown frontage management, biodiversity, biosecurity, climate action and emergency management.
	Environment Protection Authority Victoria (EPA)	EPA is Victoria's environmental regulator. As an independent statutory authority under the *Environment Protection Act 2017*, EPA's regulatory role is to prevent and reduce harm to human health and the environment from pollution and waste. EPA Victoria uses a range of tools available under the Act to deliver improved outcomes for Victorian communities and the environment. These include the provision of guidance on how to minimise harm to waterways from pollution and waste.
	Parks Victoria (PV)	Parks Victoria manages parks and conservation reserves in which many waterways are located, including national, state, wilderness, metropolitan and regional parks, marine national parks and sanctuaries and conservation and natural features reserves. They play a role in vegetation protection from fire. They create, manage, and maintain visitor sites and manage a range of assets, including visitor facilities and access points, piers and jetties, sporting facilities and navigation aids, many of which are associated with waterways.
	Victorian Environmental Water Holder (VEWH)	The Victorian Environmental Water Holder is appointed under the *Water Act 1989* to manage Victoria's environmental water entitlements. The Victorian Environmental Water Holder works with the waterway managers, Commonwealth Environmental Water Holder, Murray–Darling Basin Authority, storage operators and land managers to ensure environmental water entitlements are used to achieve the best environmental outcomes.
	Victorian Fisheries Authority (VFA)	The Victorian Fisheries Authority (VFA) is an independent statutory authority with responsibility of managing Victoria's fisheries resources in a coordinated and strategic way to ensure their ongoing sustainability, while supporting the value

	Partners	Waterway roles, responsibilities and interests
		they deliver to the commercial, recreational and Aboriginal fishing, aquaculture sectors, and the broader community. The VFA works with government and stakeholders to optimise the social, cultural and economic benefits of Victoria's fisheries and aquaculture industry, while promoting sustainable and responsible practices.
	Landcare Victoria Incorporated	Independent representative body for Landcare in Victoria. Exists to secure increased recognition, resourcing and support for Landcare. Serves the broader Landcare community within Victoria and represents paid members.
	Trust for Nature	Responsible for helping people protect biodiversity on private land, including wetlands and riparian areas. This includes conservation covenants, land management stewardship, Revolving Fund program, land ownership and management and assistance in arranging native vegetation offsets.
Water Corporations	Grampians Wimmera Mallee Water (GWMWater) Corporation	Water corporations in Victoria are established under the *Water Act 1989* and provide a range of water services to customers within their service areas. GWMWater Corporation provides a combination of domestic and stock services, bulk water supply services and urban water and wastewater services in the Wimmera region. Their link with the RWS includes: • Broader catchment health and improved water quality links to water supply. • Water reform, operational role in environmental water management. • Management of large storages and surrounding recreational areas.
Local Government	Horsham Rural City Ararat Rural City Pyrenees Shire Hindmarsh Shire Northern Grampians Shire West Wimmera Shire Yarriambiack Shire Buloke Shire	Councils are involved in the management of waterways in Victoria through their role as responsible planning authorities, managers of stormwater drainage and onsite domestic wastewater systems, users of integrated water systems, land managers, emergency management bodies, litter authorities, and supporters of community groups. Specifically, regarding waterways, local government have the following roles and responsibilities: • Incorporate waterway restoration and catchment management objectives, priorities, and actions into statutory planning processes. • Undertake floodplain management and flood warning in accordance with the Victoria Flood Management Strategy. • Develop and implement integrated water management plans. • Regulate on-site domestic wastewater systems. • Manage waterway lands as committees of management under the *Crown Land (Reserves) Act 1978*.

	Partners	Waterway roles, responsibilities and interests
		• Manage rural drainage schemes where appropriate. • Prepare municipal emergency management plans, including for the protection of environmental assets that consider the cultural, biodiversity and social values including impact on waterways. • As a litter authority, oversee litter enforcement within the local government area. • Work with local community groups and individuals on the amenity and social values of waterways.
Community	Community Groups and volunteers	Community and volunteer groups and programs such as Landcare, 'Friends of' groups, and recreational fishing groups participate in regional planning, priority setting and the implementation of regional works programs, participate in monitoring waterway condition and undertake projects in priority areas. Community groups undertake voluntary advocacy and on-ground management activities. They provide essential local insights and knowledge to inform waterway management priorities and actions. Volunteers also contribute through citizen science programs.
	Landcare Networks including: Horsham and District Landcare Network Project Platypus Yarrilinks Landcare Network	Landcare Networks are community-based organisations that provide support to Landcare Groups and landholders in their local areas through leadership, planning and provision of resources.
	Committees of management of Crown land reserves (delegated responsibility by the government to manage crown land)	Voluntary committees whose role under the Victorian *Crown Land Reserves Act 1978* is to "manage, improve, maintain and control" Crown land reserves that have been set aside for the benefit of the people of Victoria. Reserves support amenities and uses such as public halls, showgrounds, gardens, bushland, caravan parks, foreshores, sporting facilities, playgrounds, swimming pools, walking tracks and rail trails.
	Landholders	Landholders are vital to successful implementation of this strategy, as most works are on privately owned land or affect areas that require private co-operation, and their land management practices have a vital role in catchment health. Under the *Catchment and Land Protection Act 1994* landholders are required to: • Protect water resources. • Avoid causing or contributing to land degradation which causes or may cause damage to land of another owner. • Conserve soil. • Eradicate regionally prohibited weeds and prevent the growth and spread of regionally controlled weeds.

	Partners	Waterway roles, responsibilities and interests
		• Prevent the spread of, and as far as possible eradicate, established pest animals.
	Individuals	Community members have an important role in protecting waterway health by avoiding and reporting pollution, reducing resource consumption, and contributing to environmental management processes.
	Industry	Industry can assist in the protection and improvement of waterways by managing its activities in accordance with the principles of ecologically sustainable development and minimising impact on the environment. Industry has obligations to prevent harm to the waterway environment under *the Environment Protection Act 2017*. Industry can assist in the maintenance and improvement of waterway condition by managing its activities to prevent harm to the environment in accordance with the General Environmental Duty, by staying informed of best practices and guidance to minimise harm and good corporate citizenship.
Research organisations	Commonwealth Scientific and Industrial Research Organisation (CSIRO) Arthur Rylah Institute of Environmental Science OneBasin CRC Universities Ecological contractors	Continue to improve the state of knowledge for waterway management and provide advice to continue to inform adaptive management particularly considering climate change and two-way learning with First Nations People.
Not-for-profit organisations	Conservation Volunteers Australia	Recruits and volunteers around Australia and across the world to support participation in diverse projects to protect and enhance the natural environment.
	Greening Australia	Engages the community in vegetation management to protect and restore the health, diversity, and productivity of Australian landscapes.

KNOWLEDGE GAPS

Effective waterway management relies on sound knowledge of environmental, social, economic and cultural values, as well as the processes that influence them.

While significant information exists for the Wimmera region, there are still knowledge gaps that limit our ability to make fully informed decisions. By targeting these gaps, we aim to ensure that future actions are evidence-based and responsive to emerging challenges.

Wimmera knowledge gaps occur under key themes:

- Erosion and sediment management
  - Priority locations for erosion control - where erosion is contributing sediment downstream and impacting high value waterways, water quality, and habitat.
  - The status of reaches downstream of erosion and effectiveness of upstream erosion control works in preventing sedimentation and impacts on habitat.
- Climate resilience and drought refuges
  - Suitable sites for managed drought refuge pools - identification of refuge locations and the feasibility of supplying environmental water via proposed or new pipelines.
- Species persistence and ecology
  - Platypus persistence beyond the MacKenzie River – investigating anecdotal observations of presence in the Upper Catchment local area and Wimmera River.
  - Golden perch spawning potential in the Wimmera River - can natural breeding be facilitated and what are the implications for restocking and ecosystem health?
  - Breeding and proliferation requirements of river blackfish - detailed ecological knowledge to support conservation and potential reintroduction efforts.
- Environmental water management
  - Comprehensive review of environmental watering in the Wimmera catchment - evaluation of environmental, social, and recreational outcomes to inform future management and planning.
- Ramsar site management
  - Ecological information to support management of key values including vegetation communities and regent parrot populations.

The Strategy's MERI Plan will outline how key knowledge gaps will be addressed, including priority investigations. It will also explain how new information will be applied to improve planning, guide waterway management, and strengthen the delivery of Strategy outcomes.

River blackfish monitoring in the MacKenzie River

MONITORING, EVALUATION AND ADAPTIVE MANAGEMENT

Monitoring, Evaluation, Reporting and Improvement (MERI) is a structured approach for tracking progress, assessing effectiveness, and guiding continuous improvement in delivering strategic outcomes. It ensures accountability and transparency by monitoring activities, evaluating results, reporting findings, and applying lessons learned to improve future planning and implementation.

For the Strategy, MERI is critical to:

- Demonstrate progress toward achieving regional waterway outcomes.
- Support adaptive management by identifying how improvements have delivered strategic outcomes.
- Provide accountability for public investment and government obligations.
- Share lessons and best practices to strengthen waterway management across Victoria and the Wimmera.

Purpose of MERI

The primary purpose of MERI is to demonstrate progress toward achieving outcomes and to improve the effectiveness of activities delivered through the Strategy.

MERI is also essential for:

- Accountability and transparency - communicating how resources are used to achieve outcomes, ensuring public expenditure and government obligations are delivered responsibly.
- Improving waterway management policy and practice by:
  - Evaluating the effectiveness of management actions.
  - Understanding external influences on long-term outcomes to inform assumptions.
  - Learning from successes, challenges, and failures.
  - Sharing lessons and best practices through reporting and other opportunities.

Key principles

Key learnings from MERI processes in previous Victorian Regional Waterway Strategies, identified during end-of-life reviews, and other CMA MERI processes have informed this Strategy. [25] Based on these learnings, the following principles will guide MERI for the Strategy:

Integrate MERI throughout the Strategy's lifecycle

- Develop a clear MERI plan upfront to ensure outcomes can be measured and tracked.
- Maintain MERI's focus through regular reviews, in addition to mid-term or final evaluations, to support adaptive management and corporate knowledge.
- Use external expertise at key stages and build internal capability in evaluation.

Align with existing monitoring and evaluation processes

- Coordinate with other frameworks to avoid duplication and create efficiencies.
- Draw on relevant programs as evidence sources, focusing on priority areas like flagship projects and formal obligations. Examples include Lake Albacutya Ramsar monitoring, Lower Wimmera Flagship, *Wimmera Regional Catchment Strategy*, and Environmental Water Management Plans.

Collaborate and communicate

- Work with partners and Traditional Owners where appropriate, ensuring data sovereignty and culturally appropriate knowledge management.
- Tailor reporting and communication to meet the needs of diverse audiences, including staff, boards, landholders, agencies, and the community.

MERI Plan for the Wimmera Waterway Strategy

The MERI Plan will provide a clear framework for tracking progress, assessing effectiveness, and informing adaptive management throughout the life of the Strategy. It will:

- Define the objectives of MERI, its coverage, intended audiences, and any limitations.
- Outline evaluation methods and timing, including formal reviews at mid-term (five years) and final (ten years), supported by regular, less formal evaluations to guide adaptive management.
- Specify responsibilities for monitoring, evaluation, reporting, and improvement activities.
- Document how implementation will lead to desired outcomes, including assumptions and linkages between inputs, activities, and outcomes.
- Establish outcome indicators to define what needs to change and measures to track progress, incorporating scientific, traditional, and local knowledge where appropriate.
- Detail monitoring methods, timing, and data sources. Monitoring will be targeted to critical evaluation questions and priority areas such as Ramsar sites, flagship waterways, and formal obligations, and aligned with existing programs to avoid duplication.
- Identify key evaluation questions framed around assessing the Strategy's impact, appropriateness, efficiency, effectiveness and legacy, balancing rigor with practicality and resource constraints.
- Specify governance arrangements and mechanisms for embedding continuous review and improvement.
- Identify processes for reporting MERI results and findings to ensure clear communication, accountability, and transparency.

The MERI Plan will ensure that progress toward outcomes is measurable, transparent, and adaptable, supporting continuous improvement in waterway management.

REVIEW

Regular reviews are essential to ensure effective implementation and identify opportunities for improvement.

Wimmera CMA will coordinate two formal reviews of the Strategy guided by the MERI Plan:

1. **Mid-term Review – After 5 years (2031)**
   This review will assess the Strategy's effectiveness and report on progress toward medium-term outcomes. It will identify minor adjustments for immediate action and consider more substantial changes where needed, such as in response to major events like fire or flood. Outcomes, priorities, and management approaches may be updated as required.
2. **Final Review – After 10 years (2036)**
   This comprehensive review will evaluate the overall effectiveness of the Strategy at the end of its implementation period and provide recommendations for the future.

Both reviews will focus on adaptive management, ensuring the Strategy remains relevant and effective.

They will be undertaken in collaboration with Traditional Owners and other partners.

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Appendix 1.

Legislation, policies and strategies informing the Regional Waterway Strategy

The key legislation, policies strategies and agreements relevant to the *Wimmera Waterway Strategy* (draft) at a regional, state, national and international level are:

Legislation

International Legislation

- *Commonwealth Biosecurity Act 2015*

National Legislation

- *Climate Change Act 2022*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Native Title Act 1993*
- *Water Act 2007*
- *Water Amendment Act 2008*

Victorian Legislation

- *Aboriginal Heritage Act 2006*
- *Catchment and Land Protection Act 1994*
- *Climate Change Act 2017*
- *Conservation, Forests and Lands Act 1987*
- *Crown Land (Reserves) Act 1978*
- *Environment Protection Act 2017*
- *Environmental Effects Act 1978 (and EE Act Ministerial Guidelines)*
- *Flora and Fauna Guarantee Act 1988*
- *Heritage Rivers Act 1992*
- *Land Act 1958*
- *Planning and Environment Act 1987*
- *Traditional Owner Settlement Act 2010*
- *Victorian Fisheries Act 1995*
- *Water Act 1989*

Policies, strategies and agreements

International

- China-Australia Migratory Bird Agreement
- Commonwealth Biosecurity Strategy
- Convention on Biological Diversity
- Convention on the Conservation of Migratory Species (Bonn Convention)
- Japan-Australia Migratory Bird Agreement
- Kunming-Montreal Global Biodiversity Framework
- Ramsar Convention on Wetlands
- Republic of Korea-Australia Migratory Bird Agreement

- The Paris Agreement
- United Nations Declaration of Rights of Indigenous Peoples

National

- Australia's Strategy for Nature 2024-2030
- Murray-Darling Basin Plan
- National Climate Resilience and Adaptation Strategy 2021-2025
- National Water Initiative
- Net Zero Plan 2050
- Threatened Species Action Plan 2022-2032

Victorian

- Protecting Victoria's Environment - Biodiversity 2037
- Pupangarli Marnmarnepu 'Owning Our Future' Aboriginal Self-Determination Reform Strategy 2020-2025
- Self-Determination Reform Framework
- Victoria's Biodiversity Strategy
- Victoria's Climate Change Strategy
- Victorian Floodplain Management Strategy
- Victorian Freshwater Fisheries Management Plan
- Victorian Rural Drainage Strategy
- Victorian Waterway Management Strategy
- Water for Victoria
- Water is Life: Traditional Owner Access to Water Roadmap

Regional

- Wimmera Regional Catchment Strategy (2021)
- Action Plan for the Regional Land Partnerships Program (Regional Catchment Strategy addendum)
- Lake Albacutya Ramsar site information sheet, ecological character description, boundary description, and Lake Albacutya Ramsar Site Management Plan
- Grampians Region Climate Adaptation Strategy
- Wimmera Floodplain Management Strategy
- Western Region Sustainable Water Strategy
- Waterway Action Plans (numerous) - Wimmera CMA | Publications & resources
- Growing What is Good: Country Plan. Voices of the Wotjobaluk Nations
- 'Meerreengeeye Ngakeepoorryeeyt' Eastern Maar Country Plan
- Aboriginal Cultural Heritage Land Management Agreements, Strategic Plans
- Water is Life Nation Statement – Barengi Gadjin Land Council
- Water is Life Nation Statement – Eastern Maar Aboriginal Corporation
- Wimmera Strategic Directions Statement
- Environmental Water Management Plan for the Wimmera River System
- Environmental Water Management Plan for the Wimmera Mallee Pipeline Wetlands
- Wimmera Carbon Ready Plan
- Wimmera Invasive Plant and Animal Management Strategy
- Trust for Nature's State-wide Conservation Plan
- Wimmera Parks Conservation Action Plan (Parks Victoria)
- Wimmera CMA's Landcare and Community Participation Plan
- Wimmera Biodiversity Action Plan
- Wimmera Platypus Management Plan (draft)
- Flagship waterway plans and MERI plans

Appendix 2.

Contributing to the Murray-Darling Basin Plan

Murray-Darling Basin outcomes are incorporated into the regional outcomes and Implementation Plan of the *Wimmera Waterway Strategy*. This helps ensure that environmental water management decisions address both local objectives and their contribution to broader Murray-Darling Basin outcomes.

Background

For Catchment Management Authorities within the Murray-Darling Basin, the *Ministerial Guidelines for Regional Waterway Strategies* state that strategies must complement and inform Victoria's contributions to the *Murray-Darling Basin Plan* (*Basin Plan*) and contribute to meeting Victoria's obligations.

The Murray-Darling Basin Authority's *Basin Plan* aims to improve and maintain healthy rivers, floodplains and wetlands. Its overarching goal is to reinstate and protect where possible the ecologically important flows that support the rivers, wetlands and floodplains of the Murray-Darling Basin. [32]

The *Basin-wide Environmental Watering Strategy* (BEWS) elaborates on the *Basin Plan's* objectives and targets by describing the expected environmental outcomes for four ecological components:

- River flows and connectivity
- Native vegetation
- Waterbirds
- Native fish. [33]

First released in 2014, the strategy is updated every 5 years. The third edition, released in 2025, was developed in consultation with relevant experts, including Basin state and territory jurisdictions and technical experts.

The BEWS describes the contribution of specific assets across the Basin to the expected environmental outcomes. Figure 17Figure 17 illustrates the hierarchy of environmental objectives established for the *Basin Plan*.

The *Basin Plan* defines environmental assets as water-dependent ecosystems that meet criteria set out in its Schedule 8, including those that:

1. Are formally recognised in international agreements or, with environmental watering, are capable of supporting, species listed in those agreements.
2. Are natural or near-natural, rare or unique.
3. Provide vital habitat.
4. Support Commonwealth, State or Territory listed threatened species or communities.
5. Support or, with environmental watering, are capable of supporting, significant biodiversity.

The expected environmental outcomes in the BEWS contribute to *Regional Waterway Strategy* outcomes for catchment management regions within the Murray-Darling Basin, including the Wimmera. *Regional waterway strategy* outcomes are also shaped by other plans and strategies and, in turn, guide objectives in Environmental Water Management Plans and Seasonal Watering Proposals for regulated waterways (see Figure 18Figure 18).

Additionally, BEWS outcomes are only relevant for regulated waterways in the Wimmera. Unregulated waterways are considered through the development of Statutory Management Plans and Local Management Rules by water corporations, as required.

Figure 17. The hierarchy of environmental objectives established for the Murray–Darling Basin (Copied from Figure 2 in Basin-wide Environmental Watering Strategy [33]).

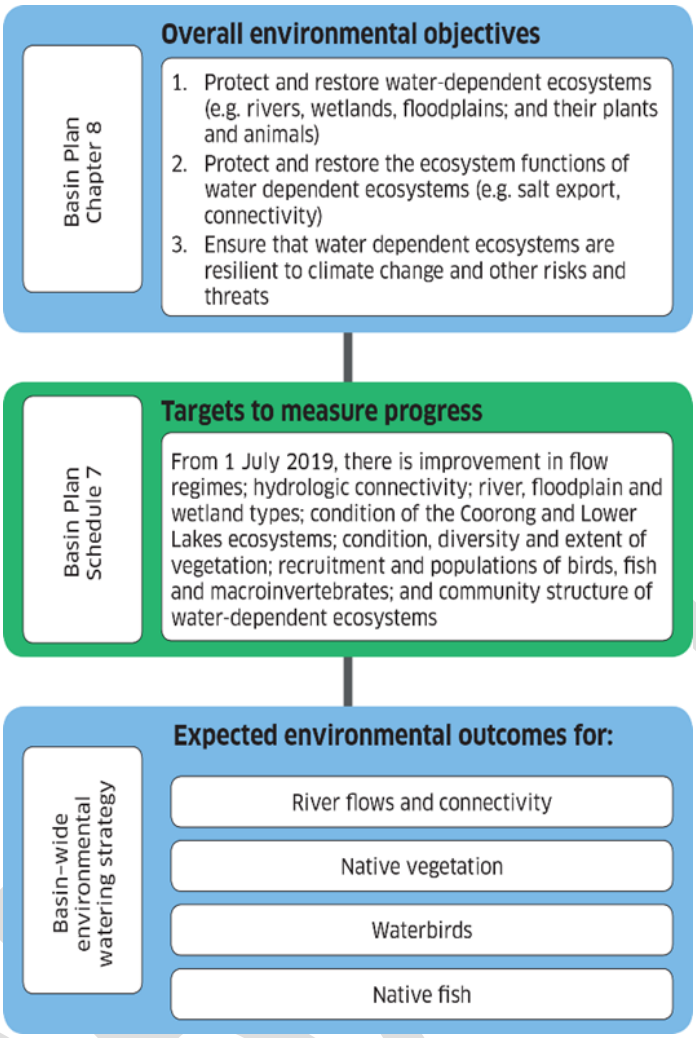

Figure 18. Linkages between outcomes in the Regional Waterway Strategy and other sources that inform Environmental Water Management Plans and seasonal watering proposals for regulated waterways. [25]

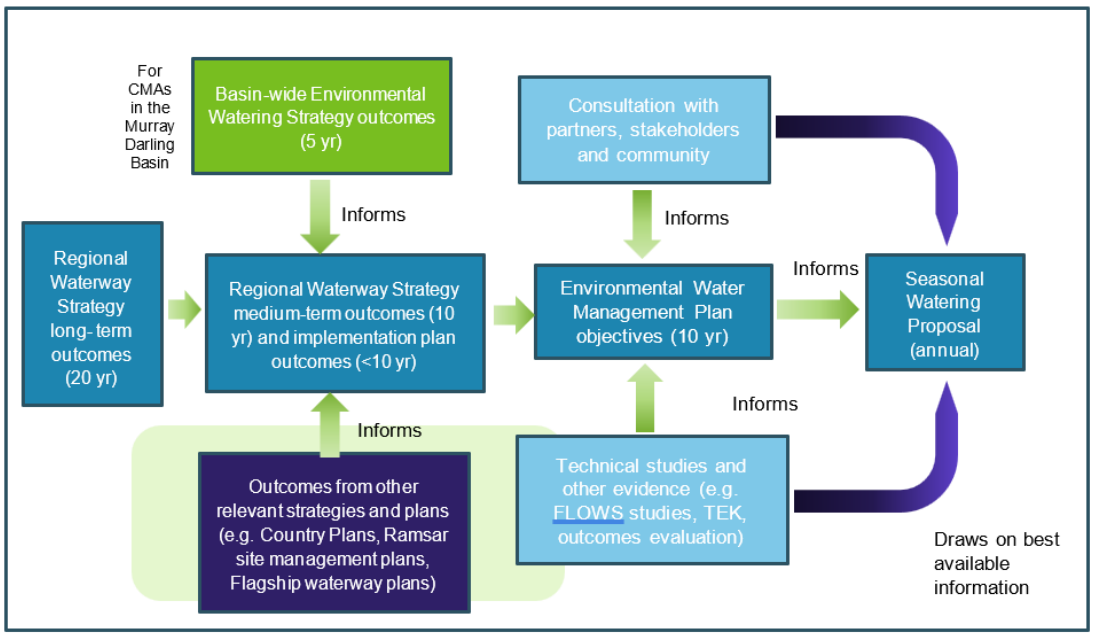

Table 7 summarises the BEWS outcomes relevant to the Wimmera and links them to the *Wimmera* Waterway *Strategy's* outcomes.

Table 7. BEWS expected outcomes by theme relevant to the Wimmera region.

Expected environmental outcomes	Region	Relevant assets	Link to *Wimmera Waterway Strategy* (RWS) outcomes	Comment
River flows and connectivity: Longitudinal connectivity				
FC1: To keep base flows at least 60% of the natural level. (note: this will be especially important during dry years). Note: Some less-developed rivers have base flows greater than 60% of natural. Where this is the case, the aim is to protect that current level of flow. In other catchments, base flows are currently well below the target 60% of natural flows, especially during dry times. Cease-to-flow events should not exceed natural, where possible.	Wimmera	River Murray tributaries (Note: are not in the Wimmera, however this outcome still applies).	The RWS does not include an outcome for flows directly. Outcomes are focused on maintaining and improving the values that flows support. Relevant 20-year long-term outcomes: • Waterways with high environmental, social, cultural and economic values are maintained. • Waterway condition, connectivity and resilience is improved, providing habitat that supports native species and communities. • Water is of sufficient quality to support waterway values and uses at important areas for water supply, cultural, environmental and social values. Relevant 10-year medium-term outcomes: • More waterways have improved management to enhance habitat, landscape connectivity, and resilience. • Net rates of streamflow interception from water extraction and storages are stabilising in the Wimmera River catchment.	Wimmera CMA uses annual seasonal watering plans for environmental entitlements to deliver outcome-focused, adaptable water management.
River flows and connectivity: Lateral connectivity				
FC6: A 10 to 20% increase of freshes and bank-full events in the Border Rivers, Gwydir, Namoi, Macquarie–Castlereagh, Barwon–Darling, Lachlan, Campaspe, Loddon and **Wimmera** catchments. Note: The degree to which these outcomes can specifically target the lower floodplain will depend on current	Wimmera	Wimmera River	The RWS does not include an outcome for flow directly. Outcomes are focused on maintaining and improving the values that flows support. Relevant 20-year long-term outcomes: • Waterways with high environmental, social, cultural and economic values are maintained. • Waterway condition, connectivity and resilience is improved, providing habitat that supports native species and communities.	Wimmera CMA uses annual seasonal watering plans for environmental entitlements to deliver outcome-focused, adaptable water management—regardless of whether conditions are dry or drought.

Expected environmental outcomes	Region	Relevant assets	Link to *Wimmera Waterway Strategy* (RWS) outcomes	Comment
constraints in each region and the work underway to address them.			• Water is of sufficient quality to support waterway values and uses at important areas for water supply, cultural, environmental and social values. Relevant 10-year medium-term outcomes: • More waterways have improved management to enhance habitat, landscape connectivity, and resilience. • Net rates of streamflow interception from water extraction and storages are stabilising in the Wimmera River catchment.	
Native vegetation: forests and woodlands				
V1: To maintain the extent of forest and woodland vegetation including approximately: • 360,000 ha of river red gum • 409,000 ha of black box • 310,000 ha of coolabah.	Wimmera (and North Central)	Wimmera-Avoca: • 6,500 ha of river red gum • 3,100 ha of black box	Relevant 20-year long-term outcomes: • Waterway condition, connectivity and resilience is improved, providing habitat that supports native species and communities. Relevant 10-year medium-term outcomes: • More waterways have improved management to enhance habitat, landscape connectivity, and resilience.	Vegetation surveys completed since 2020 could be used as a baseline to assess changes, but unlikely to address the full outcomes and area.
V2: Improved age class structure of river red gum, black box and coolabah communities to support viable population demographics.				
V3: No decline in the condition of river red gum, black box and coolabah across the Basin.				
V4: Improved condition of river red gum in the Lachlan, Murrumbidgee, Lower Darling, Murray, Goulburn-Broken and Wimmera-Avoca.				

Expected environmental outcomes	Region	Relevant assets	Link to *Wimmera Waterway Strategy* (RWS) outcomes	Comment
Native vegetation: shrublands				
V5: To maintain the extent of the large areas of lignum shrubland within the Basin. V6: Improvement in the condition of lignum shrublands.	Wimmera	Wetlands in Wimmera-Avoca	Relevant 20-year long-term outcomes: • Waterway condition, connectivity and resilience is improved, providing habitat that supports native species and communities. Relevant 10-year medium-term outcomes: • More waterways have improved management to enhance habitat, landscape connectivity, and resilience.	Extent is not mapped or known
Native vegetation: non-woody				
V7: To maintain the extent of non-woody vegetation. (Current extent is not mapped or known)	Wimmera	Wimmera River (closely fringing or occurring within)	Relevant 20-year long-term outcomes: • Waterway condition, connectivity and resilience is improved, providing habitat that supports native species and communities. Relevant 10-year medium-term outcomes: • More waterways have improved management to enhance habitat, landscape connectivity, and resilience.	Extent is not mapped or known but we undertake vegetation surveys when funding is available. Recent
V8: Increased periods of growth for communities that closely fringe or occur within the main river corridors.	Wimmera	Wimmera River		Vegetation surveys completed since 2020 could be used as a baseline to assess changes, but unlikely to address the full outcomes and area.
V9: Increased periods of growth for communities that form extensive stands within wetlands and floodplains including (but not limited to) Moira grassland in Barmah-Millewa Forest; common reed and cumbungi in the Great Cumbung Swamp and Macquarie Marshes; water couch on the floodplains of the Macquarie and Gwydir rivers; and marsh club-rush sedgelands in the Gwydir.				
Waterbirds				
B1: The number and type of waterbird species present in the Basin will not fall below current observations.	All	Lake Albacutya Lake Hindmarsh	*Regional waterway strategy* outcomes focus on maintaining, and improving where possible, waterway habitat for waterbird species.	Wimmera CMA carries out bird monitoring when key sites receive water, such as Lake Hindmarsh

Expected environmental outcomes	Region	Relevant assets	Link to *Wimmera Waterway Strategy* (RWS) outcomes	Comment
B2: A significant improvement in waterbird populations in the order of 20 to 25% over the baseline scenario, with increases in all waterbird functional groups.		These assets are considered critical to achieving a sustainable Basin waterbird community, although do not receive held environmental water.	Relevant 20-year long-term outcomes: • Waterway condition, connectivity and resilience is improved, providing habitat that supports native species and communities. • Waterways with high environmental, social, cultural and economic values are maintained. Relevant 10-year medium-term outcomes: • More waterways have improved management to enhance habitat, landscape connectivity, and resilience. • Wetland modification, loss and deterioration of condition occurs at a declining rate. • Drought refuges support species' survival and resilience during dry periods.	and Dock Lake. Monitoring occurs to assess sites where water is present, when funding is available. Baseline data is unavailable. RWSs should consider management actions to maintain flows to these assets, as well as complementary management actions that support their health.
B3: Breeding events (the opportunities to breed rather than the magnitude of breeding per se) of group-nesting waterbirds to increase by up to 50% compared to the baseline scenario.				
B4: Breeding abundance (nests and broods) for all of the other functional groups to increase by 30-40% compared to the baseline scenario, especially locations where the *Basin Plan* improves over-bank flows.				
Fish				
F1. No loss of native fish species currently present within the Basin.	All (basin wide)	Appendix C in the BEWS lists important environmental assets for native fish and the reasons, including:	Relevant 20-year long-term outcomes: • Waterway condition, connectivity and resilience is improved, providing habitat that supports native species and communities. • Waterways with high environmental, social, cultural and economic values are maintained.	The Wimmera Native Fish Management Plan together with the RWS guides implementation of native fish actions. The Native Fish Report Card and regular fish monitoring occur when funding is available.

Expected environmental outcomes	Region	Relevant assets	Link to *Wimmera Waterway Strategy* (RWS) outcomes	Comment
F2. Improved population structure of key fish species through regular recruitment.		• Key movement corridors • High biodiversity • Site of other Significance • Key site of Hydrodynamic diversity • Threatened species • Dry period/drought refuge	Relevant 10-year medium-term outcomes: • Key water-dependent species are supported in waterways that provide suitable habitat, including during dry conditions. • More waterways have improved management to enhance habitat, landscape connectivity, and resilience. • Drought refuges support species' survival and resilience during dry periods.	The Native Fish Report Card and regular fish monitoring occur when funding is available.
F3. Increased movement of key fish species.				Details on current barriers and recommendations for fish barriers when any future improvements are planned.
F4. Expanded distribution of key fish species and populations in the northern and southern Basin.				The RWS and Native Fish Management Plan outline priorities for expanding native fish in the Wimmera, particularly river blackfish.
F5. Improved community structure of key native fish species.				The Native Fish Report Card and regular fish monitoring occur when funding is available.
F6. Restored distribution and abundance to levels recorded pre-2007 (prior to major losses caused by extreme drought). This will require annual or biennial recruitment events depending on the species. Note: focus is on short-lived species.	All (asset scale but relevant assets are not specified in the BEWS)			The Native Fish Report Card and regular fish monitoring occur when funding is available. It will be extremely challenging to achieve this expected environmental outcome for non-stocked native fish species in Wimmera waterways due to dry climate and reduced rainfall and runoff since 1997.
F7. Improved population structure (i.e. a range of size/age classes for all species and stable sex ratios where relevant) in key sites. This will require annual recruitment events in at least eight out of 10 years at 80% of key sites, with at least four of these being 'strong' recruitment events. Note: focus is on moderate-long lived species.				The Native Fish Report Card and regular fish monitoring occur when funding is available.

Expected environmental outcomes	Region	Relevant assets	Link to *Wimmera Waterway Strategy* (RWS) outcomes	Comment
F8. A 10–15% increase of mature fish (of legal take size) for recreational target species (Murray cod and golden perch) in key populations.				The Native Fish Report Card and regular fish monitoring occur when funding is available.
F9. Annual detection of species and life stages representative of the whole fish community through key fish passages; with an increase in passage of Murray cod, trout cod, golden perch, silver perch, Hyrtl's tandan, congolli, short-headed lamprey and pouched lamprey through key fish passages to be detected in 2019–2024; compared to passage rates detected in 2014–2019.				The Native Fish Report Card and regular fish monitoring occur when funding is available. Assessment is limited as there are no fishway passages on the larger weir pools along the Wimmera River.
F17. Significant increases in the distributions of key species in the southern Basin. (This may be achieved through the use of re-introductions of species into suitable sites).				Wimmera CMA is supporting fish translocation opportunities by "housing" bred fish in wetland and dam surrogacy sites until they are ready to be reintroduced into Murray-Darling Basin waterways.