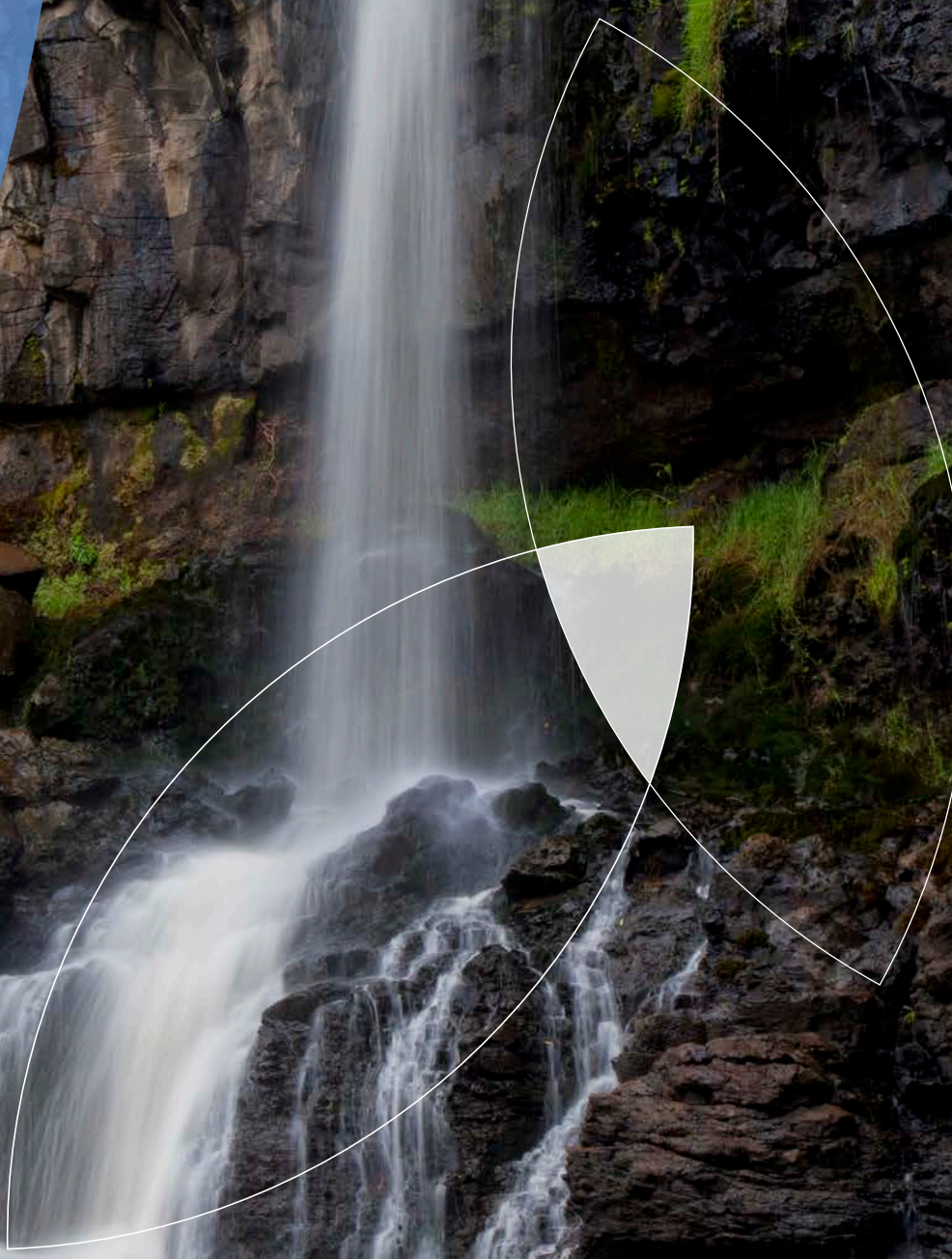




Central Highlands

STRATEGIC
DIRECTIONS
STATEMENT

2022



Integrated Water
Management Forums



Environment,
Land, Water
and Planning

ACKNOWLEDGEMENTS

The Central Highlands Integrated Water Management Forum area includes Wadawurrung and Dja Dja Wurrung Country, whose ancestors and their descendants are the Traditional Owners of this Country. The forum proudly acknowledges Victoria's Aboriginal communities and their rich culture and pays its respects to their Elders past and present. The government also recognises the intrinsic connection of Traditional Owners to Country and acknowledges their contribution to the management of land, water and resources. We acknowledge Aboriginal people as Australia's first peoples and as the Traditional Owners and custodians of the land and water on which we rely. We recognise and value the ongoing contribution of Aboriginal people and communities to Victorian life and how this enriches us. We embrace the spirit of reconciliation, working towards the equality of outcomes and ensuring an equal voice.

This Strategic Directions Statement has been developed by the Central Highlands Integrated Water Management Forum, which includes the following organisations:



The new Department of Energy, Environment and Climate Action (DEECA) was established on 1 January 2023. This department includes the previous functions of the Department of Environment, Land, Water and Planning, excluding the Planning portfolio and those areas supporting it which are now part of the New Department of Transport and Planning.

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Printed by Finsbury Green, Melbourne.

ISBN 978-1-76136-213-2 (print)

ISBN 978-1-76136-210-1 (pdf/online/MS Word)

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Cover photo: Moorabool Falls. Photographer: Central Highlands Water (Andrew Thomas)

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FOREWORD

The Central Highlands region is undoubtedly a region in change. More people are living in and visiting the region, and the effects of climate change are already being felt. Together with urbanisation and changing land use, this is highlighting the need to protect, preserve and rehabilitate the natural environment.

All of this change underscores the important work of the Central Highlands Integrated Water Management (IWM) Forum. In its first three years, the forum has focused on identifying the key challenges in the region and identifying and advancing collaborative IWM opportunities that improve the sustainability, liveability and prosperity in the region's cities and towns.

Forum members have brought their diverse perspectives, talents and commitment to leverage opportunities right across the water cycle. Representing Traditional Owners, local governments, statutory authorities and government agencies, members have collaborated to good effect. We are particularly appreciative of the contribution from representatives of the Dja Dja Wurrung and Wadawurrung Traditional Owners, as they take on an increasingly active and leading role in water management.

This update to our Strategic Directions Statement (SDS) provides a snapshot of our progress to date and describes projects that illustrate our success. While we are pleased with our progress, we know there is much still to be done; this updated SDS also outlines our planned and potential projects for the next three to five years.

We recognise that our region faces considerable challenges. Climate change and population growth continue to put pressure on water security, while the pandemic has impacted our people and economy in untold ways. Yet we are also resilient and resourceful, and we know that by working collaboratively and seeking innovative and integrated solutions we can – and will – take positive steps towards addressing these challenges.

I am excited about the opportunities that lie ahead for our region. I thank all members of the Central Highlands IWM Forum for their contribution to this SDS and, most importantly, for everything they are doing to ensure a sustainable, prosperous and liveable future for our region.

Jessie Harman

Chair, Central Highlands IWM Forum

Moorabool Reservoir. Credit: Central Highlands Water (Andrew Thomas)

EXECUTIVE SUMMARY

The *Integrated Water Management Framework for Victoria* (2017) is designed to help water managers and stakeholders work together to improve how the water cycle contributes to the liveability of towns and cities in Victoria, with communities at the centre of decision making.

The Central Highlands Integrated Water Management Forum is one of 10 regional integrated water management (IWM) forums across Victoria that are realising the local implementation of the framework.

Our vision

Working together to leverage opportunities across the water cycle to deliver a healthy, resilient and prosperous future for the region and its communities.

The 2018 SDS articulated the collaborative intent and shared agreement of all stakeholders involved in the Central Highlands IWM Forum. This 2022 update provides a progress report on the forum's activity, its changing priorities and future opportunities. It describes the water security challenges and opportunities of the region, sets a strategic direction for the next few years, and outlines the 'best endeavours' or ways in which IWM is and will be applied through projects proposed, in progress or completed for the region.

Key themes

The forum's experience since establishment has highlighted the need to focus the vision to five key areas:

- population growth: more people are visiting and living in the Central Highlands
- the Central Highlands as a region is already experiencing the impact of climate change
- water security is needed for the region's changing agricultural sector and economic future.
- the natural environment needs protection, preservation, and rehabilitation
- Traditional Owners are taking an increasingly active and leading role in water management.

The priorities and projects of the forum have been developed to meet these emerging challenges.

Dean Reservoir. Credit: Central Highlands Water (Andrew Thomas)

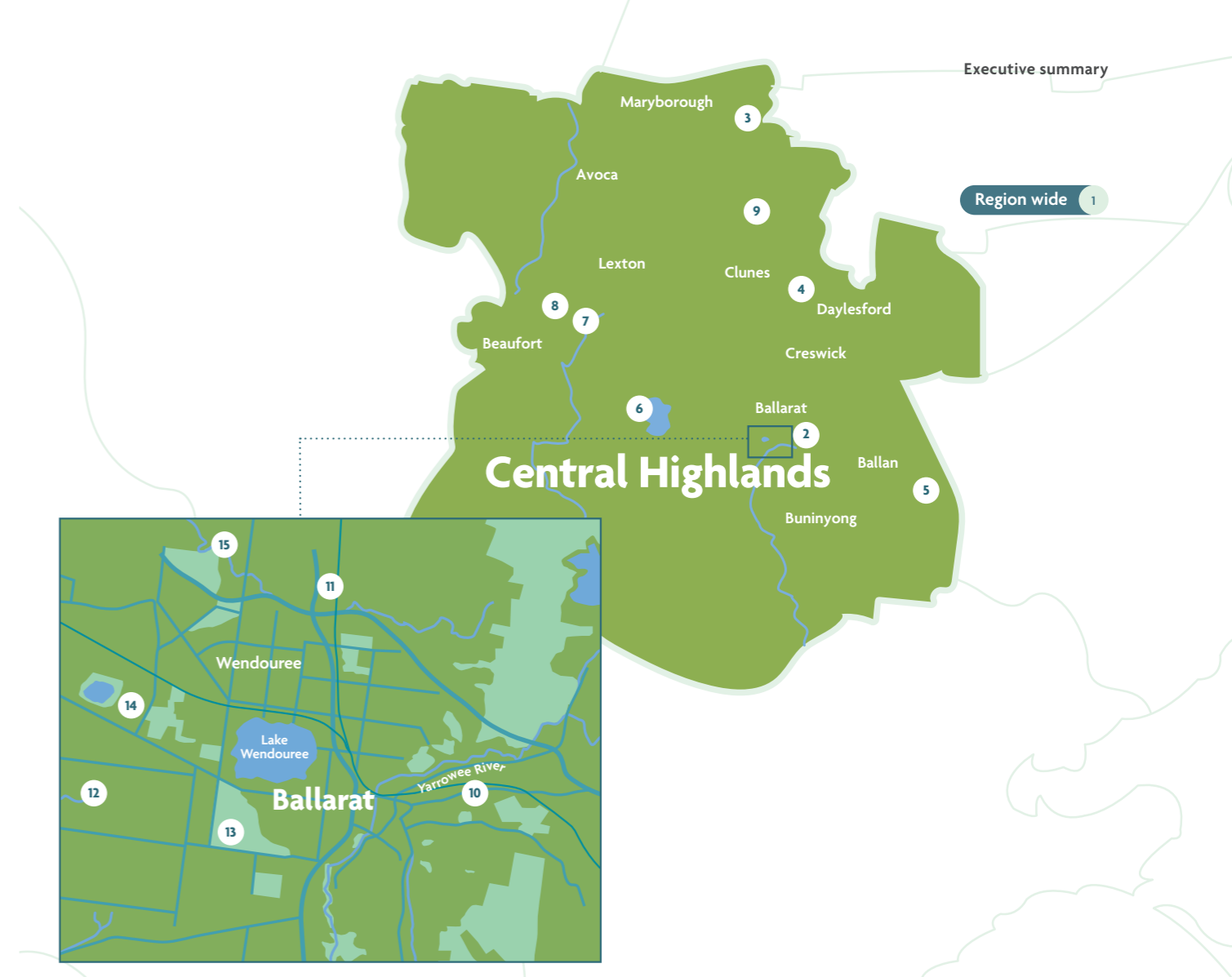
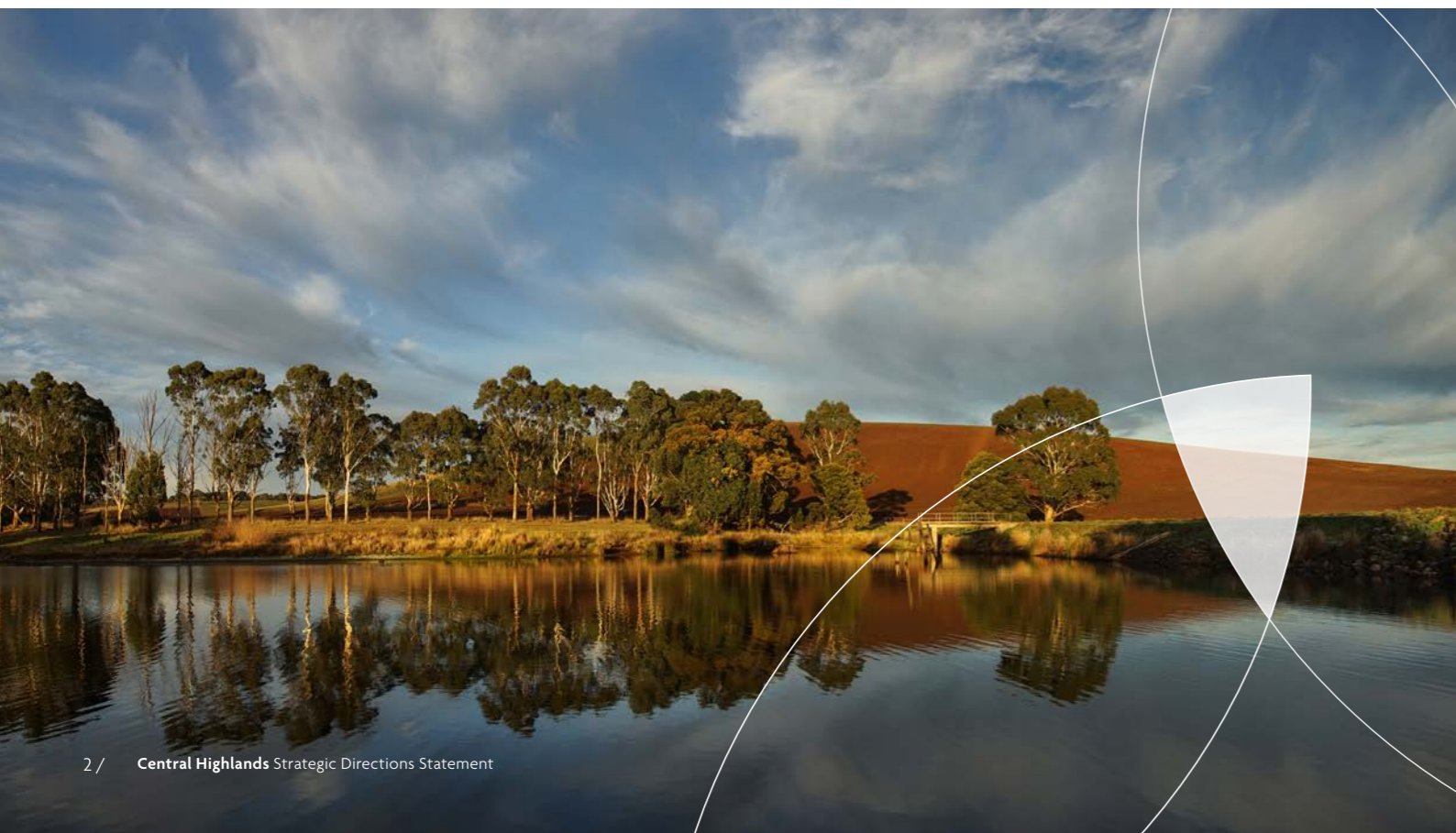


Figure 1 : Locations of IWM opportunities across the Central Highlands region. Locations are approximate or representative.

IWM opportunities

Fifteen opportunities have been identified in the region and these have been grouped into four geographic groups:

Regional enablers

1. Support for Wadawurrung and Djaara Care-for-Country Opportunities
2. Enhancing Flows to the Moorabool and Leigh Rivers

Prioritising action in major urban centres

3. Maryborough IWM Plan Implementation
4. Daylesford and Hepburn Springs, Creswick and Clunes IWM Plan Implementation
5. Ballan IWM Plan

Delivering benefits in key regional locations

6. Revitalising Lake Burrumbeet
7. Beaufort Closed-Loop Recycled Water Scheme
8. Beaufort Linear: Green-Blue Infrastructure for a Small Town
9. Integrated Management of the Tullaroop Catchment (Stage 2 – Implementation)

Building on momentum in Ballarat

10. Breathing Life into the Yarrowee River: Implementing Priority Actions
11. Expanding Ballarat's Diverse Water Network
12. Ballarat West Stormwater Harvesting Hubs
13. Recycled Water for a Green Victoria Park
14. Mullawallah Wetland Management Plan
15. Miners Rest Flood Mitigation

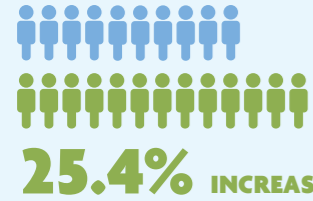
Central Highlands Integrated Water Management Forum Strategic Directions Statement 2022 summary

We work collaboratively with partners across the water cycle to find new ways to share resources and conserve water for multiple community and environmental benefits.

We work to meet the water needs of a changing region.

POPULATION GROWTH

173,000 (2021)
217,000 BY 2036

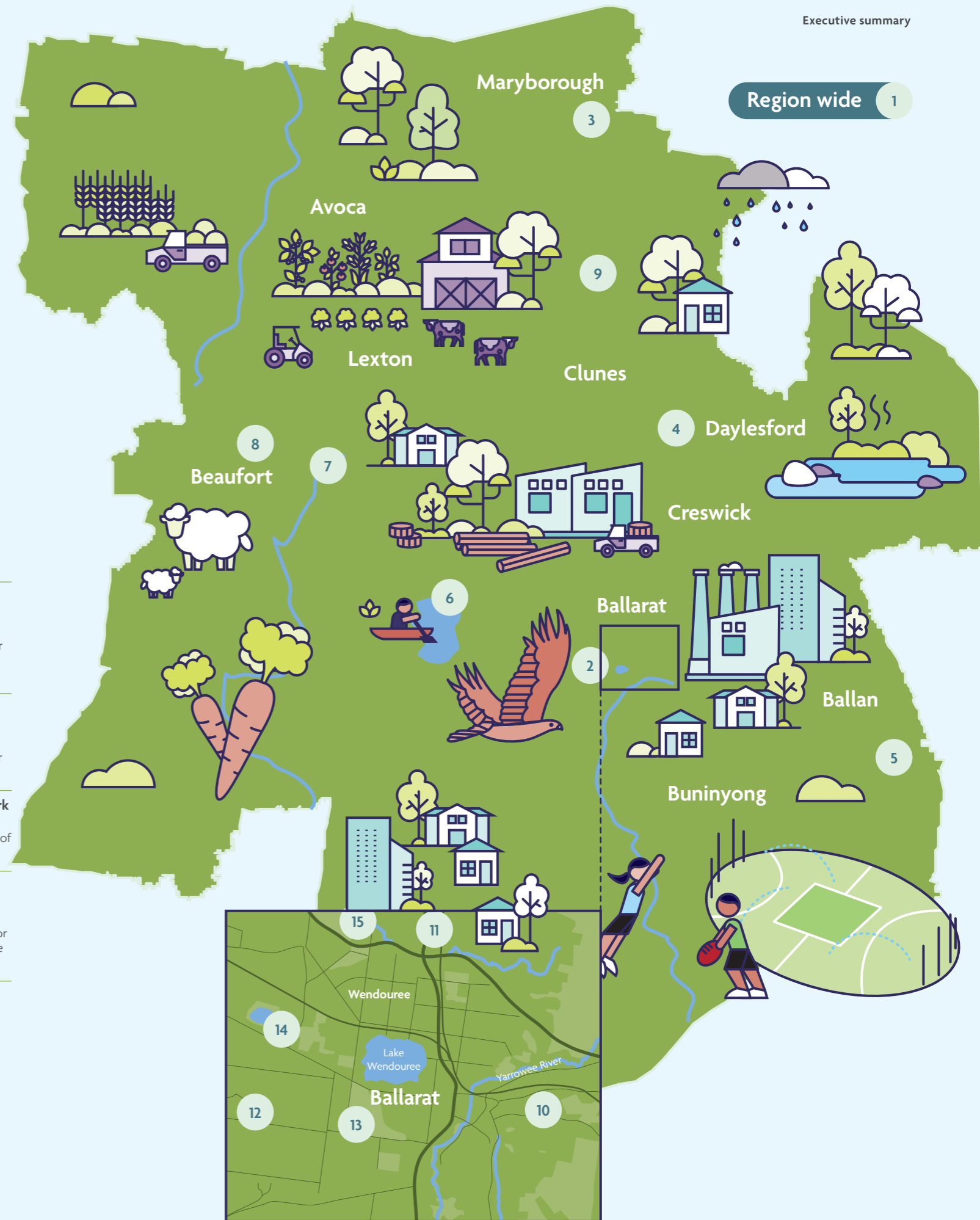


CHANGE IN RAINFALL BY 2040
DECREASE BY 16.2%
WITH MORE-INTENSE RAINFALL IN SOME YEARS



TEMPERATURE
AN INCREASE OF 0.7-1.6°C
IN CENTRAL HIGHLANDS BY 2040*

* Population data: Victoria In Future 2019
* Temperature and rainfall are the highest and lowest predictions across the Avoca and Moorabool catchments. Predictions represent the annual average at 2040 relative to the year 1995. Source: Guidelines for Assessing the Impact of Climate Change on Water Availability in Victoria, November 2020.



- 1. Support for Wadawurrung and Djaara Care-for-Country Opportunities**
Commitment to support Traditional Owner self-determination and led IWM projects as these opportunities arise.
- 2. Enhancing Flows in the Moorabool and Leigh Rivers**
Improving the volume and timing of flows into these rivers to protect biodiversity and cultural values.
- 3. Maryborough IWM Plan Implementation**
Implement opportunities from the plan, to enhancing water resources, supporting urban greening and liveability, improve the health of local waterways and water bodies, and driving economic and social benefits.
- 4. Daylesford and Hepburn Springs, Creswick and Clunes IWM Plan Implementation**
Implement a range of priority IWM opportunities identified within these towns and across the Hepburn Shire.
- 5. Ballan IWM Plan**
Articulating a community vision and identifying IWM opportunities for Ballan.

- 6. Revitalising Lake Burrumbeet**
Identifying and prioritising opportunities to benefit communities, the environment and enhance cultural values at Lake Burrumbeet and connected waterways.
- 7. Beaufort Closed-Loop Recycled Water Scheme**
Greening local community assets using recycled water from the Beaufort's wastewater treatment plant.
- 8. Beaufort Linear: Green-Blue Infrastructure for a Small Town**
Creating a blue-green corridor that connects highly valued recreational assets for the Beaufort community.
- 9. Integrated Management of the Tullaroop Catchment (Stage 2 – Implementation)**
Implementing opportunities to improve catchment health and secure water supplies, while enhancing cultural values.
- 10. Breathing Life into the Yarrowee River: Implementing Priority Actions**
Implementing priority actions from the Yarrowee River and Tributaries: River Corridor Masterplan.

- 11. Expanding Ballarat's Diverse Water Network**
Increasing the use of rainwater, recycled water and stormwater in Ballarat to meet a range of demands and save precious drinking water.
- 12. Ballarat West Stormwater Harvesting Hubs**
Making the most of treated urban stormwater in future growth areas by planning early.
- 13. Recycled Water for a Green Victoria Park**
Developing detailed designs for the irrigation of Victoria Park with recycled water.
- 14. Mullawallah Wetland Management Plan**
A Wadawurrung project managing water on Country, by developing a management plan for the Mullawallah Wetland that considers future changes in climate and catchment hydrology.
- 15. Miners Rest Flood Mitigation**
Exploring flood prevention and management options that enhance waterways and improve water quality.

BETTER TOGETHER: INTEGRATING WATER MANAGEMENT ACROSS VICTORIA

The first water custodians

First Nations clans have been living in balance with the natural environment in Victoria, practising culture, caring for Country and waterways, and maintaining sophisticated water management systems for tens of thousands of years.

In the words of the Wadawurrung, 'Our waterways connect us to our stories; it was our cultural way of travel and connection to other tribes. The diverse water on Country, rivers, creeks, waterholes and ocean all provide us with food sources and nourish the wellbeing of all life. Without access to Country and water, we are limited in our role and ability to care for Country.'¹

The Dja Dja Wurrung (Yes Yes speaking) Jaara (people of this Country) believe that all of Country has Murrup (spirit), all things from creation are made of the same source of life. Water has spirit.

More than 6,000 years ago, in south-western Victoria, the Gunditjmara worked with the waterways along the Budj Bim lava flow, engineering an extensive and sophisticated aquaculture system to trap, store and harvest kooyang – short-finned eel. That system still lives and operates, the Budj Bim Cultural Landscape is now an UNESCO World Heritage List site.

Pressures emerge and evolve

European settlement and the gold rush of the 1850s saw thousands of people flock to Victoria to seek their fortunes. This created many towns, yet also had large and long-lasting impacts on the creeks and gullies and displaced Traditional Owners from their Country.

Victoria's regional towns and cities have thrived with the provision of urban drinking water and sanitation services. Irrigated agriculture and dryland farming have both played important roles in Victoria's history and growth. Today, Victoria is the nation's largest food and fibre exporter.² Much of the water flowing into the Murray-Darling Basin System comes from the Victorian High Country and underpins irrigated agriculture in several states.

The complex challenges of water management continue throughout the state: we have lived through the Millennium Drought and experienced flooding, bushfires and extreme weather. We have seen the consequences of the overuse and overallocation of water in one area affecting the availability and/or quality of water in another. Significant investment and

interventions have been required to start returning water to our rivers and floodplains, yet more remains to be done.

Water managers are now operating in an increasingly complex and uncertain environment. The drivers of change are both social and environmental, including climate change, population growth, shifting migration patterns associated with the coronavirus pandemic, economic challenges, and policy changes. But our beautiful state remains a wonderful place to live, and we continue to see the population increase. Regional Victoria is expected to grow from 1.5 million people in 2015 to 2.2 million over the next 30 years to 2051.³

The liveability of our regional towns and cities and the health of our environment and economy depend on the availability of water. Access to water is also important for social wellbeing and holds intrinsic cultural value for Aboriginal Traditional Owners. Therefore, we need an integrated and collaborative approach to adapt to change and maximise value across the whole water cycle.

What is IWM? How can it help address challenges?

The current water supplies and liveability of towns and cities owe much to the collaborative work done to date by water corporations, local and state government, planning and development authorities, communities and, in recent decades, catchment management authorities. While we face the challenges of population growth, climate change and natural disasters, we can also build on the benefits of past experiences and established relationships. Together, we can make decisions today that we will celebrate in the future.

Integrated water management considers all parts of the water cycle as an integrated system to optimise the environmental, cultural, social and economic outcomes for our communities.

While everyone has a responsibility to conserve and protect water, there are a number of key groups charged with making decisions about water within each region. These include:

- Traditional Owner groups, who have a deep knowledge of and connection to the region's waterways, other water resources and Country
- water corporations, which manage the water storage, water supply, and wastewater services
- local governments, which manage surface water drainage, protect local waters from degradation and pollution, oversee onsite domestic wastewater planning, regulate local development, and undertake strategic planning for future growth

- catchment management authorities, which plan for flood management and work with landholders to consider the interactions of land, water and biodiversity.

The decisions these groups make individually, can have significant impacts on the quality and availability of the water for others in the catchment and further downstream. So, it makes sense they collaborate towards common goals to maximise water saving and reuse and share the benefits (Figure 2).

IWM is an approach that can be applied at multiple scales from water planning at the local park, right up to the whole of catchment. IWM can connect climate-change adaptation, planning and open space, water security and other strategies, so that collaborators can add value to each other's projects.

What is integrated water management?

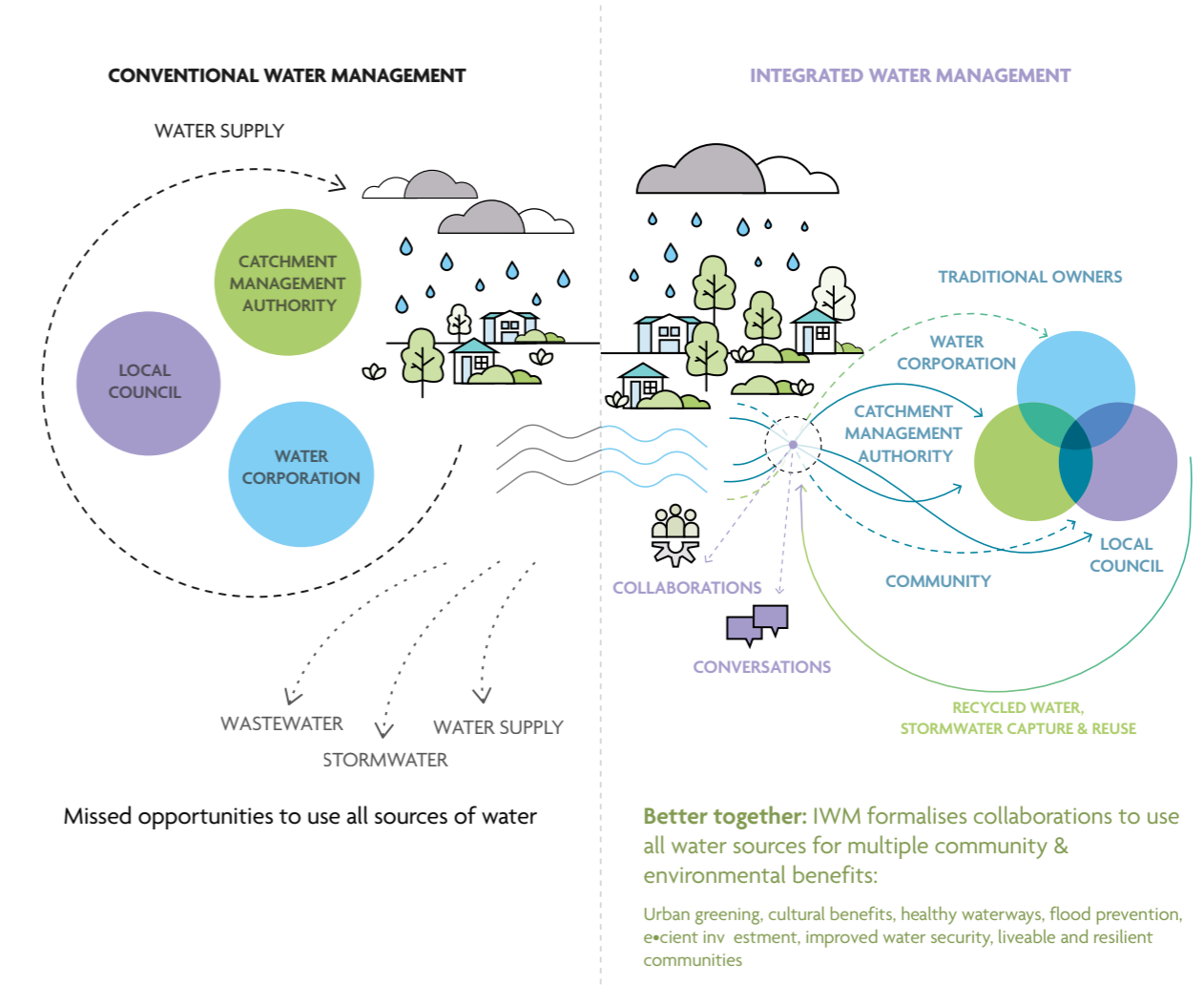


Figure 2: How does IWM work? Conventional water management saw a more siloed approach to water management, with a single supply source and two discharge systems to move stormwater and wastewater away as quickly as possible, resulting in missed opportunities to use all sources of water. The IWM approach brings water managers together to plan and deliver new opportunities to provide broader benefits to the community. Listening to and consulting with Victorian communities about how they want water managed is critical to informing IWM decision making. Communities are directly consulted on IWM plans and through existing catchment management authority, water corporation and local government strategies.

1 Paleert Tjaara Dja – let's make Country good together 2020-2030, Wadawurrung Country Plan
 2 Victorian Food and Fibre Export Performance Report 2019-20
 3 Victoria in Future 2019

How are we delivering IWM state-wide?

To facilitate IWM across Victoria, the Victorian Government's former Department of Environment, Land, Water and Planning (DELWP) supported the establishment of IWM forums across 10 regions of Victoria (Figure 3). These forums bring together leaders of the local water sector to explore, prioritise and oversee the development of local IWM opportunities. Prioritised opportunities are managed and implemented by dedicated working groups and are captured within individual IWM plans. Where appropriate, the forums involve other organisations and groups that are not part of the water sector but have direct or indirect interests in water management and land use planning, such as community and Indigenous groups, planning authorities, former Department of Transport, developers, educational institutions, or large landholders.

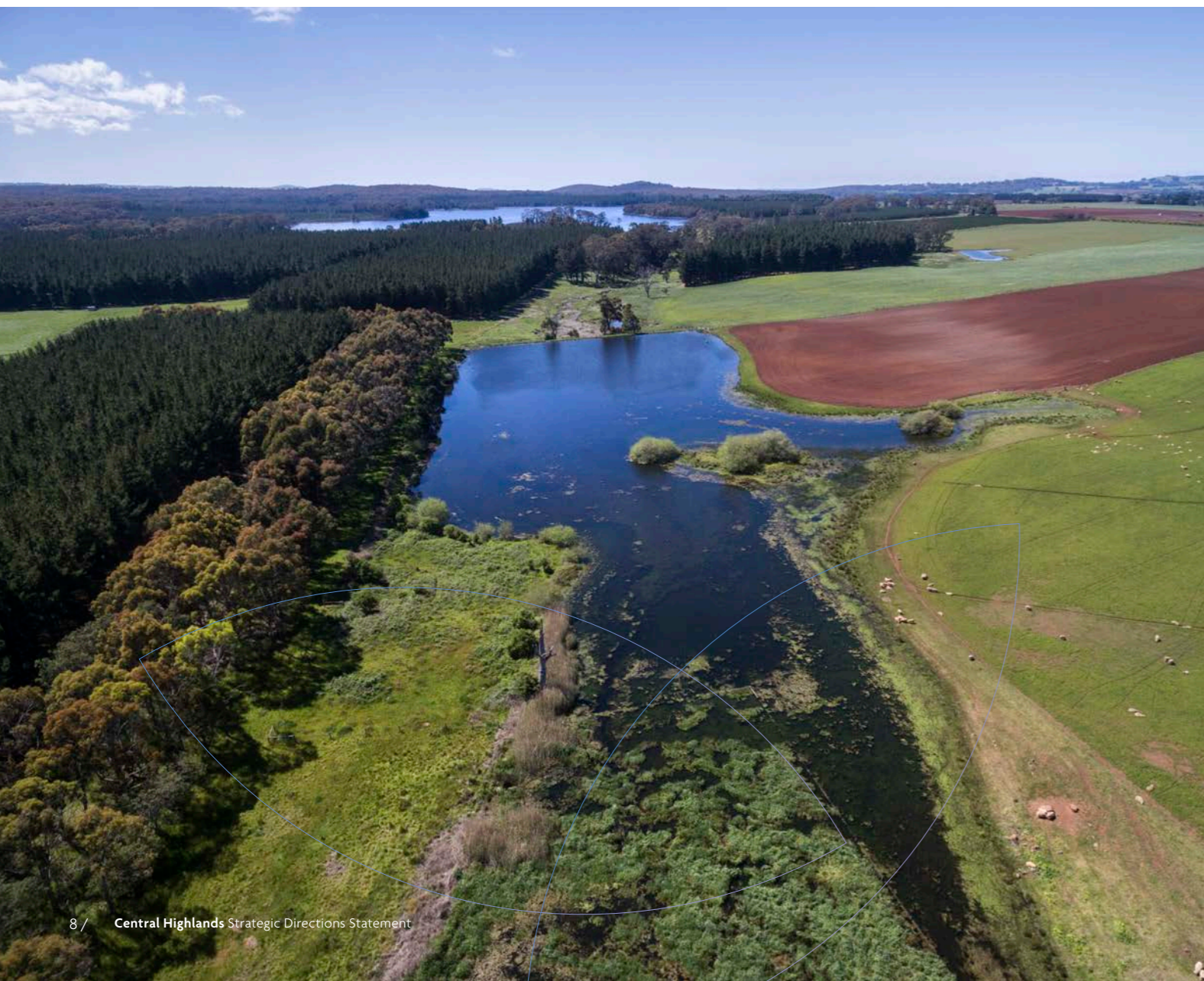
Being collaborative, IWM builds on existing partnerships and planning processes, and aims to break down silos between independently operating water decision-makers – encouraging forum members to consider the water cycle of their own service delivery, and the interdependencies or overlaps with other members (Figure 2). Forum members consider waters in rivers, streams and bays, wastewater, drinking water, stormwater, and water treatment processes.

While collaboration can take more time and effort, working together achieves better outcomes for the environment, society, and the economy by finding mutually beneficial ways to share water, assets, and costs.



Figure 3 : IWM forum regions of Victoria, which are based around water corporation boundaries

Wetlands near Tullaroop Reservoir. Credit: Central Highlands Water (Andrew Thomas)



Strategic outcomes

The *Integrated Water Management Framework for Victoria* (2017) proposed several strategic water-related outcomes that will deliver on the vision in the State water plan, *Water for Victoria* (2016), to 'build resilient and liveable cities and towns'. These strategic outcomes provide a way to identify the multiple economic, social and environmental benefits that can come from a single initiative. The original framework included five such strategic outcomes that have since been expanded to seven. The identification of strategic outcomes will continue to evolve as the water management context changes and the sector innovates.

Proposed project opportunities are assessed and prioritised against how well and how many of these strategic outcomes they meet.

To find out more about how Victoria is applying IWM in *Integrated Water Management Framework for Victoria* (2017), visit www.water.vic.gov.au

The strategic outcomes are:

-  **safe, secure and affordable supplies in a changing future** – indicated by the amount of water conserved or alternative water volume supplied to meet an identified demand.
-  **effective and affordable wastewater systems** – ensuring environmental and public health standards are met, while maximising resource recovery.
-  **manage flood risks** – resilience to existing and future flood risk.
-  **healthy and valued waterways and waterbodies** – indicated by the ecological health of riparian areas, hydrology and water quality.
-  **healthy and valued landscapes** – maximising the connectivity, accessibility, greening and vegetation, cooling, aesthetic and/or recreational values of landscapes
-  **Traditional Owner and community values reflected in place-based planning** – ensuring that different communities are considered and included in planning and design, and provided with water-systems literacy to enable involvement.
-  **jobs, economic opportunity and innovation** – recognising that water management is an integral part of economic growth.

Strategic Directions Statement – how IWM is happening in the region

This SDS articulates the collaborative intent and shared agreement of all stakeholders involved in the forum. It describes the water security challenges and opportunities in the region, sets the strategic direction for the next few years, and outlines the 'best endeavours' or ways in which IWM is and will be applied through opportunities that are proposed, in-progress or completed in the region.

This is the first update to the Central Highlands region's SDS produced in 2018, and includes:

- an update on progress to date
- case studies illustrating IWM in the region
- details of planned and potential opportunities designed to meet the strategic outcomes and key challenges over the next three to five years.

This SDS has been developed to complement the other plans and strategies that apply to the region for water, climate change, First Nations' rights and catchment management (Figure 4).

Figure 4 : The SDS and related water policies, strategies and plans of the region.



Water for Victoria

State government strategic plan for management of our water resources, now and into the future.

Integrated Water Management Framework for Victoria

Whole-of-catchment water planning and management to maintain and enhance the liveability, prosperity and resiliency of Victoria's cities and towns. Applied through five metropolitan and 10 regional IWM forums..

2022 Central Highlands IWM Forum SDS

A revised statement of agreement between Forum members of urban and peri-urban IWM priorities and collaborative projects..

Relevant plans and strategies in place in the region



Central Highlands Urban Water Strategy

A detailed, 50-year forecast of water demands for local communities, along with supply options to meet these demands. Renewed every five years.



Caring for Country Plans: Wadawurrung Country Plan, Dja Dja Wurrung Country Plan

Guiding and promoting awareness, investment and the rights of Aboriginal people and culture, working together now and for future benefits.



Central and Gippsland Region Sustainable Water Strategy

Long-term plans and statutory processes for state-wide water resource planning to secure the water future of Victoria's regions.



Corangamite, Glenelg Hopkins, North Central and Wimmera Regional Catchment Strategies

A framework of action for all community, agencies and organisations to utilise in natural resource management decisions in the North Central, Corangamite and Glenelg Hopkins catchments. Incorporating climate change, it is a partnership approach to catchment resilience.



Climate Change Adaptation Strategies

Grampians Region Climate Adaptation Strategy: Community-led vision capturing actions and strategic goals to ensure the Wimmera, Southern Mallee, and Central Highlands is climate-ready for the present and future. Unites individual, community and agency approaches.

Corangamite Natural Resource Management Plan for Climate Change: Corangamite Catchment Management Authority's plan to incorporate climate change mitigation and adaption into natural resource management.



Local government plans and strategies

Various strategies, plans, guidelines and other documents that have connections to the water cycle. Examples include open-space plans, local climate change adaptation strategies, and natural disaster management plans.

WATER IN THE CENTRAL HIGHLANDS

The Central Highlands region is home to more than 173,000 people, a diversity of plant and animal life, and is the birthplace of nine major Victorian river systems.⁴ The region crosses the Country of the Wadawurrung and Dja Dja Wurrung, whose ancestors and their descendants are the Traditional Owners of this land and its waters.

Many food products enjoyed around the nation come from this part of Victoria including dairy, beef, lamb, poultry, eggs, grains, wine grapes and market garden vegetables. It hosts major food processors, including Mars Chocolate Australia and McCains. Wool and timber are also major exports. The breathtaking native forests, mineral spring spas and popular tourist destinations, such as Daylesford and Sovereign Hill, attract thousands of visitors each year. Local wildlife includes Victoria's animal emblem Leadbeater's possum, the short-finned eel, the culturally significant wedge-tail eagle, the smoky mouse, the powerful owl, and other keystone and iconic species. Average annual rainfall varies across the region, from nearly 800 mm east of Ballarat to 526 mm in Maryborough.

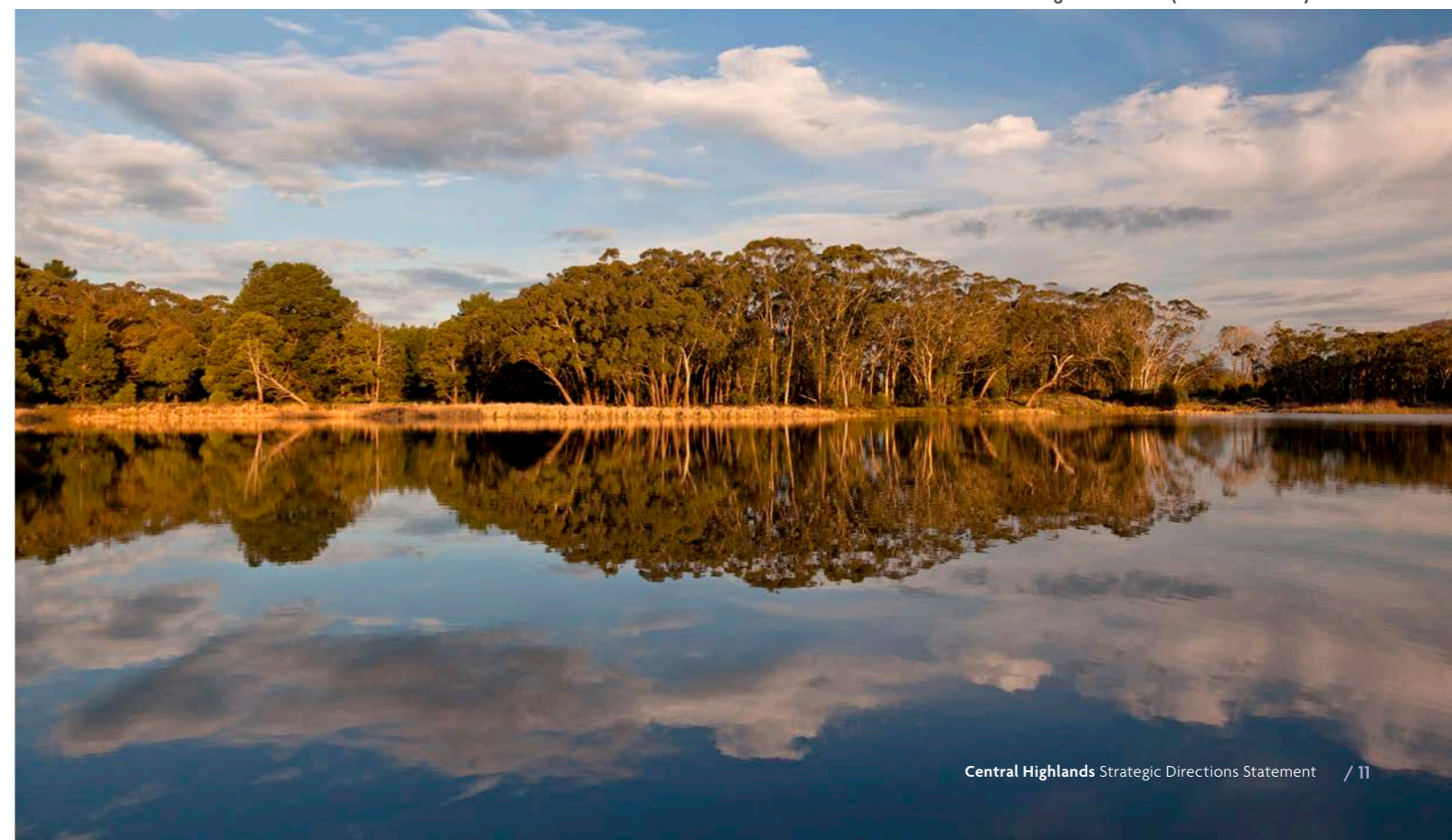
The forum covers an area of approximately 9,275 square kilometres, extending from Rokewood in the south to Redbank in the north, reaching as far as Ballan and Daylesford to the east and Navarre in the west. Ballarat is the largest city in the region and is one of Victoria's most populous regional cities.

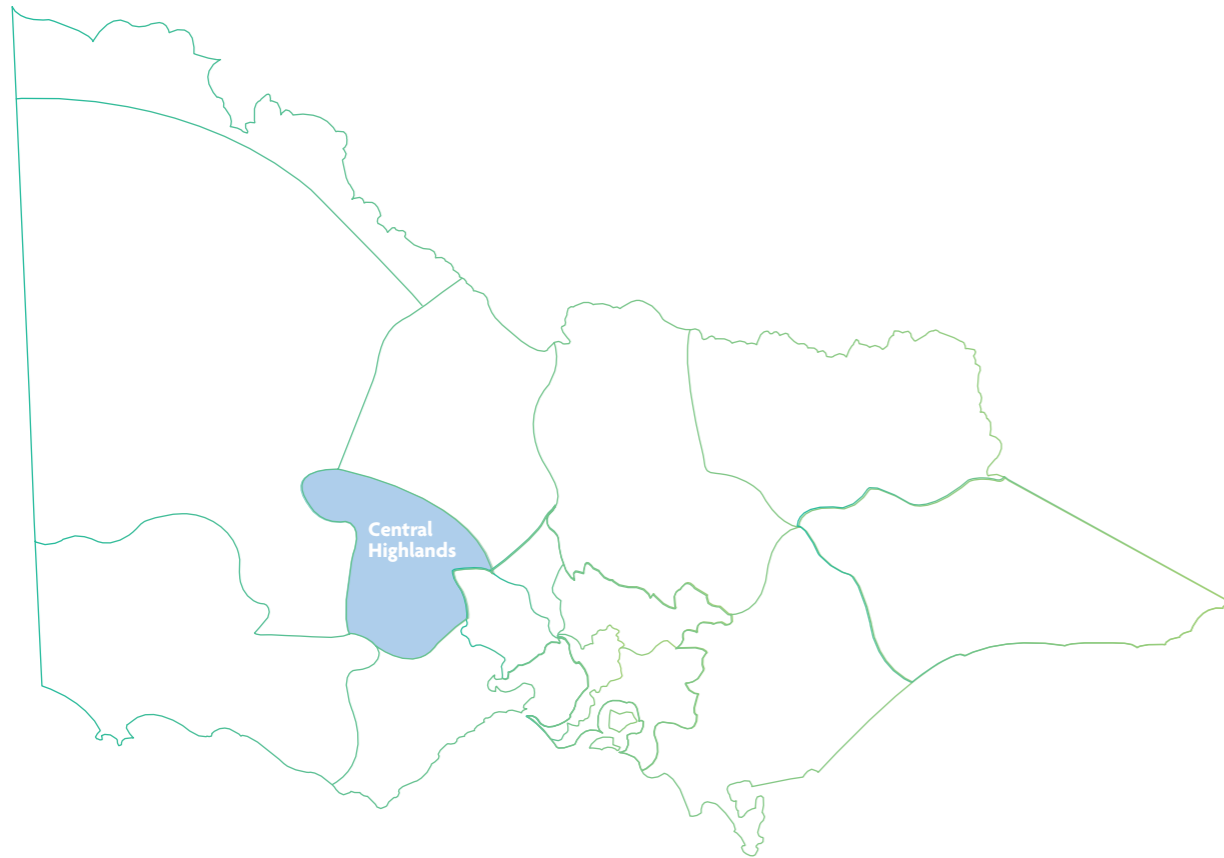
The region also includes large towns – including Maryborough, Daylesford and Ballan – and more than 60 smaller towns, making the region and its water opportunities very diverse.

As the name indicates, the region includes the highlands of a number of catchments and incorporates areas managed by four catchment management authorities – North Central, Glenelg Hopkins, Corangamite and Wimmera. Major waterways include the Yarrowee-Leigh, Moorabool, Avoca and Loddon Rivers, as well as a number of important smaller waterways such as Tullaroop Creek and Burrumbeet Creek. The Leigh and Moorabool Rivers are also key sources of water for the Ramsar listed wetlands in the Barwon region. There are important waterbodies and wetlands throughout the region that provide ecological, amenity, recreational benefits and local character, including Lake Burrumbeet, Lake Wendouree, Lake Victoria and Daylesford Lake. These waters also contain a rich and diverse range of important cultural heritage sites and form a culturally important and significant part of Country for Traditional Owners in the region.

4 Victoria in Future

Pincotts Reservoir. Credit: Central Highlands Water (Andrew Thomas)





A CHANGING REGION

More people are visiting and living in the Central Highlands

Victoria in Future (2016) predicted an average regional population growth of one and a half per cent annually from 2018 to 2036. The first two years of this period saw growth exceed expectations, making water sensitive urban design in new residential areas and water services in small towns an urgent need. Four major urban areas are prioritised for action: Ballarat, Maryborough, Daylesford, and Ballan.

More recently, the global coronavirus pandemic saw a substantial increase in the number of people migrating from Melbourne to Victoria's regional areas and closed international borders have resulted in a domestic tourism boom.

These population trends influence the use of water resources. Drinking water and sewage treatment services are an obvious public health need, but water is also important for liveability – it enhances the landscape and the community's use of it.

sediment and pollutants in urban stormwater, increasing the risk of harming the health of urban waterways, if not managed properly.

These challenges and approaches to addressing them are detailed further in the Grampians Region Climate Adaptation Strategy, online at: www.adaptgrampians.com.au/about/#strategy. IWM will assist in monitoring and adapting to climate change as a shared responsibility.

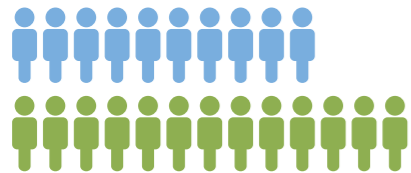
Water security is needed for the region's changing agricultural sector and economic future

The region is a major producer of food, fibre and forestry products, making agriculture a key contributor to the region's prosperity, now and in the future. Water underpins agriculture and, as such, is an enabler of economic growth and job creation, from large food processing businesses in major population centres to boutique food and agribusinesses in small towns.

Central Highlands agriculture has an important role to play as Australia's population grows to more than 35 million people by 2050. As a food and fibre producer and exporter, the region needs to address the challenges of climate change adaptation and the changing water cycle. However, there are also opportunities for the agriculture sector with Victoria State Government support for moving towards a 'circular economy'. For example, biosolids – the nutrient-rich organic material left over after sewage treatment – can be applied to agricultural land to improve soil structure, nutrient levels, and water retention. The Central Highlands Water Clunes Soil Nutrient Improvement Facility is already processing biosolids for reuse, delivering on significant environment, economic and social sustainability outcomes.

POPULATION GROWTH

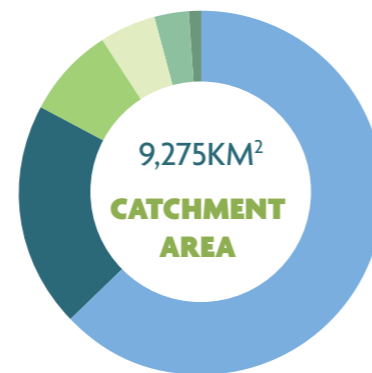
173,000 NOW (2021)
217,000 BY 2036



25.4% INCREASE

THE REGION

- DRYLAND PASTURE 63%
- NON-FARMLAND 20% (RURAL LIVING, ROADS AND WATER BODIES)
- BROAD ACRE CROPPING 8%
- NATIVE VEGETATION 5%
- HORTICULTURE 3%
- URBAN 1%



The Central Highlands are already experiencing the impact of climate change

The climate is changing, and the Central Highlands region is preparing for a warmer, drier future. The La Niña event of late 2021 has seen full dams and waterlogged soil in regions, but this is a temporary reprieve. It is likely the effects of heat extremes, fire, and drought will worsen and become more frequent, significantly impacting ecosystems and the community. Recent years have seen an increase in heat-related illness and deaths across Victoria, particularly in more built-up urban areas with less vegetation. Decreasing rainfall is also predicted, particularly during the cooler months.

The Millennium Drought caused Lake Wendouree in Ballarat to dry up. In the summer of 2008–2009, there were several fires in the grass that had grown out of the dry lake bed. The region is experiencing more days of extreme fire risk. The Black Summer fires of 2019–2020 provide a stark warning to be prepared.

Future fires will require water for firefighting. Fires and other natural disasters will need increased capacity to manage water quality in the catchment and deal with dirty water events. Changing weather patterns will also influence the growing seasons for agriculture and timing of periods of high water demand. More sporadic and intense rainfall will see more



CHANGE IN RAINFALL BY 2040

DECREASE BY 16.2% WITH MORE-INTENSE RAINFALL IN SOME YEARS



TEMPERATURE AN INCREASE OF 0.7-1.6C INCREASE BY 2040

CONDITION OF WATERWAYS

	AVOCA	MOORABOOL
GOOD:	0%	0%
MODERATE:	74%	57%
POOR:	24%	5%
VERY POOR:	2%	38%



Sources:
Population data: Victoria in Future 2019
Temperature and rainfall are the highest and lowest predictions across the Avoca and Moorabool catchments. Predictions represent the annual average at 2040 relative to the year 1995. Guidelines for Assessing the Impact of Climate Change on Water Availability in Victoria, November 2020.
Waterway condition sources: Third Index of Stream Condition report - ISC North Central Region and Third Index of Stream Condition report - ISC Corangamite Region



Lake Wendouree, Ballarat. Credit: DEECA

The natural environment needs protection, preservation, and rehabilitation

Climate change, urbanisation and changes in land use continue to put pressure on the region's waterways and landscapes. Several ecosystems, such as areas of mountain ash forest and the flow-stressed Moorabool River, are already under pressure and need rehabilitation and revegetation. IWM offers the potential for people to work together to manage water flows in urban and natural environments, so that flood waters are less damaging, water pollution is prevented, and water is directed where it's needed. A healthy environment benefits wildlife and the community and is an important consideration for climate change adaptation.

Traditional Owners are taking an increasingly active and leading role in water management

The Central Highlands region is Wadawurrung and Dja Dja Wurrung Country as well as the Country of many Aboriginal communities that identify a connection to land.

There is growing recognition of Traditional Owners' and First Nations' right to self-determination and inherent obligations to continually speak for and look after the Country of their ancestors and for current and future generations. Traditional Owners in the Central Highlands are taking more of a leadership role.

Victoria is the first state to progress Treaty discussions, the First Peoples' Assembly of Victoria has formed, and there is increasing understanding among Victorians of Indigenous rights, connection to Country, and the need for inclusion, consultation, and reconciliation. IWM is increasingly being considered in this context.

This SDS highlights the key challenges in the region and also identifies collaborative IWM opportunities that can address climate change and other key drivers to improve resilience and liveability in cities and towns in the region.



Growing grass frog. Credit: DEECA

PROGRESS SO FAR

The first Central Highlands IWM Forum SDS was published in September 2018. It articulated the regional context, the shared vision and the strategic water-related objectives for the region. It also listed IWM opportunities as ‘ready to advance’ projects, developed collaboratively by the forum partners. It can be viewed online at www.water.vic.gov.au



Many forum members have IWM at the forefront of their thinking and several are regularly implementing IWM as their principal approach to water management. The projects – past, current and future – listed in this document and endorsed by the forum members are those that will create shared benefits from a collaborative, multi-party approach. The first SDS identified 13 opportunities that reflect the Central Highlands IWM Forum’s initial priorities and opportunities. Most of these opportunities are underway or completed. Progress on the 2018 SDS projects is summarised in Table 1. Five projects have been completed, including the Daylesford IWM Plan, an important project for the region that has been expanded to include other townships. The ‘Breathing Life into the Yarrowee River: Works Prioritisation Masterplan’ project has been completed and new priority action are to be implemented. Six more projects are underway.

The Central Highlands IWM Forum is flexible and responsive to the changing needs and priorities of local governments and other members. The forum acknowledges that, while some projects are going well, IWM hasn’t been implemented as well as hoped, with some projects delayed as forum members dealt with the impacts of the coronavirus pandemic and greater than expected population growth. Of the two 2018 projects yet to commence, one has been scheduled, and the other is still planned as a priority for future years and included in this SDS.

Much of the forum’s project work over the last three years has been conceptual, focused on planning, conducting feasibility studies, developing business cases, and building strong working relationships between collaborators. These relationships and ways of working together have been the great success of the forum. The next phase will see forum members working together on the implementation of IWM projects, with scope to develop further opportunities that grow from them. Future work will also be informed by the recovery targets set in the region’s Sustainable Water Strategy (SWS).

Table 1: A summary of the status of IWM opportunities listed in the forums 2018 SDS.

IWM opportunity	Status	Notes
Mapping of Cultural Values on Waterways by Traditional Owners	In progress	Significant progress in methodology for shared Traditional Owner values identification. This project is on-going in nature.
Enhancing Flows to the Moorabool and Leigh Rivers	In progress	Background studies for this project are underway and has been incorporated into the draft SWS..
Central Highlands Small Towns Green-Blue Infrastructure Plan	Completed	A guide for green-blue infrastructure in small towns has been developed and is now available for use. See case study on page 18. Collaboration facilitated through this project led to the development of the ‘Beaufort Linear: Green-Blue Infrastructure for a Small Town’ project. See page 31
Maryborough IWM Plan	Completed	The plan was delivered in 2020. One of the projects identified in this plan, the Station Domain Precinct stormwater harvesting concept design, has already received funding. Further implementation of this plan is outlined in this SDS. See page 26
Daylesford IWM Plan	Completed	Originally centred on Daylesford only, the scope of this project was expanded to include Hepburn Springs, Creswick and Clunes as additional towns within the Hepburn Shire. This plan was finished in 2022. The implementation of this plan is outlined in this SDS. See page 27.
Ballan IWM Plan	Scheduled	Now that the Daylesford IWM Plan has finished, IWM planning for Ballan is next in line, expected to commence in 2023. See page 28
Revitalising Lake Burrumbeet and Burrumbeet Creek	In Progress	Work is underway to revitalise the creek, with enthusiastic community support. Cultural heritage values have been identified for Burrumbeet Creek. Included in this SDS as ‘Revitalising Lake Burrumbeet’. See page 29
Beaufort Closed-Loop Recycled Water Scheme	In Progress	This project is under construction and will supply recycled water to multiple recreational spaces through ‘purple pipes’. Construction will be completed in late 2022. See page 30
Integrated Management of the Tullaroop Catchment (Stage 1 - Planning)	Completed	This integrated catchment plan was completed in 2020 and is ready for implementation. See page 32
Breathing Life into the Yarrowee River: Implementing Priority Actions	Completed	The Masterplan for the Yarrowee River has been completed. Priority actions have been identified for implementation. Examples include connecting and enhancing key visitor areas, incorporating a sense of past present and future, improving the rivers ecology and adopting an IWM approach. See page 33
Expanding Ballarat’s Alternative Water Network	In Progress	Prioritised projects are in development, with some included for implementation in this SDS. Now renamed as Expanding Ballarat’s Diverse Water Network project. See page 34
Ballarat West Stormwater Harvesting	Not started	This opportunity has been enabled through the Precinct Structure Plan (PSP) development process. As the Ballarat West PSP is advanced over the next 20 years, the finalisation of detailed designs for this infrastructure is still a priority. See page 35
Victoria Park (Ballarat) Greens Space Transformation	In Progress	Early assessments and designs are complete and detailed designs are underway and are expected to be completed in early 2023. The next stage, construction, is proposed in this SDS as ‘Recycled Water for a Green Victoria Park’. See page 35

Case study

Central Highlands Small Towns Green-Blue Infrastructure Guide

A practical guide enabling water-sensitive small towns everywhere

The Central Highlands Water region has nearly 60 small towns with populations between 100 and 10,000 people. Fully-fledged integrated water management (IWM) plans are beyond the capacity and budgets of most, but that doesn't mean they can't benefit from elements of IWM.

'Green-Blue Infrastructure' (GBI) elements present opportunities to implement IWM in small towns. GBI refers to the natural and built assets within urban landscapes that combine living (green) infrastructure, such as parks and vegetation, with water (blue) infrastructure, such as rainwater tanks or waterways.

Central Highlands Councils Victoria, an alliance of eight central Victorian municipal councils, led a project to develop the 'Greening Small Towns: A plan for green-blue infrastructure in small towns of Victoria's Central Highlands' – a 'how-to' manual to help local governments plan and implement GBI projects in small towns, from rain gardens and tanks at the lot scale to wetlands and green corridors that manage rainwater and stormwater at a precinct scale.

This guide is now ready for use by local governments and organisations that are implementation partners. Practitioners involved in the development process say one of the best outcomes of the project has been the conversations had during workshops run in 2019 and 2021 which informed the final guide. IWM lies at that intersection between health and wellbeing, engineering, environment, planning and culture, all of which came together through the people involved in the workshops, giving practitioners a chance to collaborate and learn from each other.

Already, those conversations and lessons are bearing fruit. For example, work on the guide has also led to the development of projects, such as the Beaufort Linear: Green-Blue Infrastructure for a Small Town project.



Examples of green-blue infrastructure. Credit: Damien D'Aspromonte, Foresight Advisory



Mt Pleasant Oval, Ballarat. Credit: Central Highlands Water (Peter Blackburn)

Case study

Integrated Management of the Tullaroop Catchment (Stage 1 – Planning)

Collaborating now for the catchment's future

The Tullaroop catchment is valued by Traditional Owners, the Djaara people, and the local community for its picturesque waterways, wetlands and surrounding landscapes. Much of the 71,818 hectares is highly productive agricultural land used for grazing and cropping. It supplies drinking water for the residents of Maryborough and surrounding areas, as well as water for downstream irrigation along the Loddon and Murray systems. It also provides a wildlife habitat and a range of additional environmental, social, cultural and economic values to communities in central Victoria.

The catchment faces continued pressure from agricultural intensification, lifestyle development and recreational access which, along with predicted climate change impacts, place increasing demand on, and threatens, water resources in the Tullaroop system. Urban influences on the catchment, such as significant stormwater inflows and septic wastewater systems are also significant threats to waterway health and the supply of safe, secure, and affordable drinking water.

The 2018 Central Highlands IWM Strategic Directions Statement identified 'Integrated Management of the Tullaroop Catchment' as a priority and an opportunity. The project brought together North Central Catchment Management Authority and Central Highlands Water with implementation partners Goulburn-Murray Water, Dja Dja Wurrung Clans Aboriginal Corporation, Hepburn Shire Council, Central Goldfields Shire, and the City of Ballarat. Together, these collaborative partners developed the Tullaroop Integrated Catchment Management Plan so that catchment challenges can be better managed. Importantly, this plan works alongside, and directly informed the Maryborough

IWM Plan and the Daylesford, Hepburn Springs, Creswick and Clunes IWM Plan which aim to improve urban water management in the catchment.

Importantly, the 30-year plan has also integrated the insights, knowledge and techniques of both a western scientific tradition and those of the Djaara people in identifying long-term, practical and meaningful actions to improve catchment health outcomes. The Dja Dja Wurrung Clans Aboriginal Corporation has played a significant role in identifying significant values of importance to Traditional Owners through an Aboriginal Waterways Assessment. The results of this work have fundamentally shaped the design of the plan as well as the priorities recommended for implementation.

The plan also incorporates the most cost-effective investments for improving river health and water supply quality. The Investment Framework for Environmental Resources was used to assess the benefits and costs of interventions, ensuring cost-effective interventions were selected as priorities.

Implementing the plan will see several different organisations and community groups working together to improve waterway health through a range of environmental works while ensuring the supply of quality water is secured for communities, and the cultural importance of the catchment is protected for the future.



Tullaroop Creek. Credit: North Central Catchment Management Authority



Tullaroop Reservoir. Credit: Central Highlands Water (Andrew Thomas)

IWM OPPORTUNITIES

IWM opportunities that link to and address challenges for the region were identified and developed by the practitioners of the forum's participating organisations.

A summary of the priority IWM opportunities is shown in Table 2, with more detail in the following section. This list is dynamic and will continue to be updated to reflect the forum's priorities and opportunities as they arise.

Partners are committing their 'best endeavours' to ensure priority projects and strategies are moved forward, in line with the shared vision and strategic outcomes of the forum.

Table 2: IWM opportunities 'ready-to-advance' in the Central Highlands region

IWM opportunity	Strategic outcomes						Location	Scale
Support for Wadawurrung and Djaara Care-for-Country Opportunities							Wadawurrung and Dja Dja Wurrung Country	Forum area
Enhancing Flows to the Moorabool and Leigh Rivers							Moorabool and Leigh Rivers	Catchment
Maryborough IWM Plan Implementation							Maryborough	Town
Daylesford, Hepburn Springs, Creswick and Clunes IWM Plan Implementation							Daylesford, Hepburn, Creswick and Clunes	Town
Ballan IWM Plan							Ballan	Town
Revitalising Lake Burrumbeet							Burrumbeet Creek catchment	Sub-catchment
Beaufort Closed-Loop Recycled Water Scheme							Beaufort	Town
Beaufort Linear: Green-Blue Infrastructure for a Small Town							Beaufort	Precinct
Integrated Management of the Tullaroop Catchment (Stage 2 – Implementation)							Tullaroop Creek catchment	Sub-catchment
Breathing Life into the Yarrowee River: Implementing Priority Actions							Yarrowee River	Sub-catchment
Expanding Ballarat's Diverse Water Network							Ballarat	Lot scale
Ballarat West Stormwater Harvesting Hubs							Ballarat West	Lot scale
Recycled Water for a Green Victoria Park							Ballarat	Precinct
Mullawallah Wetland Management Plan							Ballarat West	Town
Miners Rest Flood Mitigation							Miners Rest	Town



Lake Learmonth. Credit: DEECA

Shade scale

	High impact		Safe, secure and affordable supplies in a changing future		Healthy and valued landscapes
	Medium impact		Effective and affordable wastewater systems		Traditional Owner and community values reflected in place-based planning
	Low impact		Manage flood risks		Jobs, economic opportunity and innovation
	To be determined		Healthy and valued waterways and waterbodies		

REGIONAL ENABLERS

‘Regional enabler’ projects facilitate region-wide IWM initiatives. These are highly collaborative opportunities with broad reach that involve and benefit a large number of stakeholders and support and elevate IWM. Three such projects from the first SDS have been delivered. A further project has been identified.

Support for Wadawurrung and Djaara Care-for-Country Opportunities

Wadawurrung Traditional Owners Aboriginal Corporation and Djaara (Dja Dja Wurrung Clans Aboriginal Corporation) conducted a 2018 SDS project to map the cultural sites and values along waterway corridors in the region. This project has created a knowledge base that can be managed by the relevant Traditional Owner groups and used to inform management of waterways and water bodies on their Country.

Building on this knowledge, it is anticipated the Wadawurrung will identify priority sites to be the focus of future IWM projects through the forum. It is anticipated that in future, the Wadawurrung will lead the development of further new IWM project proposals, in addition to the Mullawallah Wetland Management Plan. The Central Highlands IWM Forum is committed to providing greater support for Traditional Owner-led IWM, as well as improving Traditional Owner partnerships, inclusion and consideration in all projects. As such, this ‘project’ is included as the forum members’ statement of intent to support self-determination and commitment to work collaboratively on Traditional Owner-led projects as they develop.

Lake Wendouree, Ballarat. Credit: Central Highlands Water.



Enhancing Flows to the Moorabool and Leigh Rivers

The Moorabool and Leigh Rivers are on the traditional lands of the Wadawurrung people who have had an ongoing connection with the river for thousands of generations.

The Moorabool River is one of the most stressed waterways in the state, and the Leigh River is heavily influenced by stormwater runoff and treated wastewater inflows from Ballarat. Both rivers flow into the Barwon and Lower Barwon Rivers, which flow through Geelong and feed Ramsar-listed wetlands. Climate change and growing populations in both Ballarat and Geelong will continue to place pressure on these significant rivers. Improvements to the volume and timing of inflows to these rivers will help protect the plants and animals dependent on them.

During 2018 and 2019, the Corangamite Catchment Management Authority updated the environmental FLOWS Study for the Upper Barwon, Yarrowee and Leigh River systems, in preparation for the Central and Gippsland Region Sustainable Water Strategy. This study found that an additional 44 GL of water a year is required to return the Barwon system to within 75% of the natural flow regime and to meet all environmental flow recommendations.

In addition, the Moorabool FLOWS Study completed in 2015 highlighted the current Environmental Entitlement (up to 2,500 ML per year) falls far short of the volume of water required to achieve the aspirational flow recommendations (14,600 to 36,000 ML).

Key findings from the Upper Barwon, Yarrowee and Leigh FLOWS Study systems include:

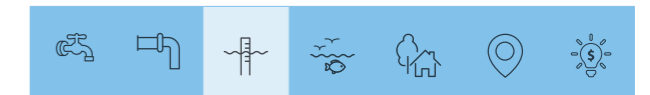
- Low flows during dry periods (such as the summer months) are important for providing habitat refuges for aquatic life, such as platypus, growling grass frog, fish, and macroinvertebrates. Dry period flows are also important for maintaining good water quality in those refuges and for providing opportunities for fish and other fauna to migrate up and down waterways
- In the Yarrowee, Leigh and Lower Barwon these low flows are predominately provided by discharge of recycled water from the Ballarat South Wastewater Treatment Plant (WWTP)
- however, the timing of the current discharges from the Ballarat South WWTP do not reflect the environments needs
- Importantly, any loss of recycled water inflows from the Ballarat South WWTP would increase the volume of water required to meet environmental needs in the Yarrowee, Leigh and Lower Barwon.

With appropriate modifications to the current timing and volume of recycled water discharges from the Ballarat South WWTP, this water source could play an important role in the long-term supply of environmental water to the Barwon River system.

The opportunity exists to examine possible long-term options to capture, treat and manage both recycled water and stormwater runoff from Ballarat to supplement environmental flows in the Moorabool River and Leigh River.

The Long-Term Water Resource Assessment for Southern Victoria also highlighted the importance of this opportunity, and the draft Central and Gippsland Region Sustainable Water Strategy includes an action (Action 8.5) to investigate options for using treated stormwater and recycled water from the Ballarat South WWTP to improve flows and waterway health in the Yarrowee River, Leigh River and Moorabool Yulluk (Moorabool River).

Protecting the diversity of life dependent on the rivers is critical to maintaining both environmental and cultural values in a drying climate.



Status	Concept
Lead agency	DEECA
Implementation Partners	Central Highlands Water, Corangamite Catchment Management Authority, City of Ballarat, Moorabool Shire Council, Southern Rural Water, Barwon Water, Wadawurrung Traditional Owners Aboriginal Corporation
Location	Moorabool and Leigh Rivers
Scale	Catchment

PRIORITISING ACTION IN MAJOR URBAN CENTRES

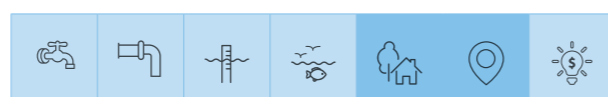
Identification and prioritisation of IWM projects has recently been done under several new IWM Plans for the region, but action is now required to implement these plans and realise their aspirations. Other major centres have been prioritised to also begin the IWM planning process, with Ballan, a growing urban centre next.

Maryborough IWM Plan Implementation

An IWM plan was developed for Maryborough (including the neighbouring areas of Carisbrook and Flagstaff) as proposed in the Central Highlands IWM Forum's 2018 SDS. The plan sets out to enhance water resources, support urban greening and liveability, improve the health of local waterways and water bodies and drive economic and social benefits in the area. The plan considers all aspects of the urban water cycle and prioritises a series of IWM projects for further investigation. The priority projects that emerged from the plan include:

- implementing schemes for greening Station Domain as a key community asset
- harnessing stormwater for healthier street trees at town entrances, in new development areas, and in central commercial and highly trafficked areas
- improving local lakes and waterways for community wellbeing, including Lake Victoria, Tullaroop Creek and Goldfields Reservoir
- diversifying and expanding the local water supply network to create greening opportunities and enhance resilience.
- supporting flood mitigation initiatives prioritised through the Carisbrook and Maryborough Flood Management Plans.

Following completion of the Maryborough IWM Plan, collaborative partners are now committed to the implementation of the plan as the opportunities arise. A concept design has already been developed for the Greening Station Domain project.



Status	Implementation
Lead agency	Central Highlands Water
Implementation Partners	Central Goldfields Shire Council, North Central Catchment Management Authority, DEECA, Djaara (Dja Dja Wurrung Clans Aboriginal Corporation)
Location	Maryborough
Scale	Town



Lake Daylesford. Credit: Hepburn Shire Council

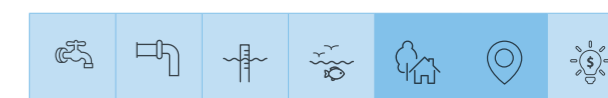
Daylesford and Hepburn Springs, Creswick and Clunes IWM Plan Implementation

Daylesford and Hepburn Springs is the third largest urban area in the Central Highlands region, and ongoing growth is forecast. The nearby communities of Creswick and Clunes are also important towns with strong tourism and visitor economies, and active communities. An IWM Plan for these communities has been developed with a community summary plan a final plan released in 2022.

The plan considers the whole water cycle and identifies and assesses a range of IWM opportunities within these towns and across the Hepburn Shire. Some of the identified priorities include:

- identification of diverse water sources for open space irrigation in Daylesford
- a recycled water use strategy for Shepherds Flat, Daylesford
- development of stormwater and rainwater harvesting opportunities for Doug Lindsay Reserve in Creswick
- a stormwater management plan for Creswick Creek
- identifying diverse water sources for use by larger water users in Clunes
- shire-wide opportunities such as investigating street and building-scale IWM opportunities, community water education programs, better planning for new developments and improving connectivity of natural and recreational spaces.

Following completion of the Daylesford and Hepburn Springs, Creswick and Clunes IWM Plan, collaborative partners are now committed to the implementation of the plan as the opportunities arise.



Status	Implementation
Lead agency	Central Highlands Water
Implementation partners	Hepburn Shire Council, North Central Catchment Management Authority, DEECA (Grampians), Goulburn-Murray Water, Regional Development Victoria, Djaara (Dja Dja Wurrung Clans Aboriginal Corporation)
Location	Daylesford, Hepburn Springs, Creswick and Clunes
Scale	Town

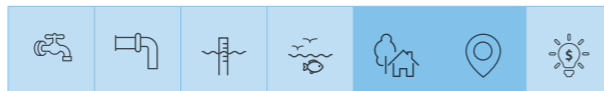
Ballan IWM Plan

Ballan is a growing urban area in the Central Highlands region, which also lies in the Werribee IWM Forum area. As identified in the 2018 SDS, there is opportunity to collaborate across both forum areas to develop a holistic IWM plan for the town.

Ballan has been identified as a priority for the Central Highlands region as, largely due to its proximity to Melbourne growth areas, it is expected to grow substantially and the towns water supply is drawn from the same network that supplies Ballarat, which already impacts on the flow-stressed Moorabool River. The management of urban stormwater in the upper Werribee catchment has also been identified as a priority in Melbourne Water's *Healthy Waterway Strategy* (2018).

An IWM plan for Ballan can articulate a community vision, identify IWM opportunities and prioritise them for delivery. IWM projects can help secure the towns water supply, enhance amenity, and ensure the resilience of green assets in the township.

Building on the experience and methodologies established for the Ballarat, Maryborough and Daylesford IWM plans, the Ballan IWM Plan is scheduled to commence in late 2022.

	
Status	Committed
Lead agency	Central Highlands Water
Implementation partners	Moorabool Shire Council, Melbourne Water, Southern Rural Water, Wadawurrung Traditional Owners Aboriginal Corporation, Werribee IWM Forum
Location	Ballan
Scale	Town

Beaufort Lake. Credit: Pyrenees Shire Council



DELIVERING BENEFITS IN KEY REGIONAL LOCATIONS

The water cycle connects people and settlements with waterways and landscapes beyond urban areas. These projects focus on IWM opportunities that connect urban communities with the outdoor environment.

Revitalising Lake Burrumbeet

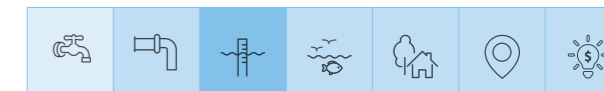
There are identified opportunities to revitalise Lake Burrumbeet and sections of Burrumbeet Creek through collaborative planning and investment. Since the identification of the Revitalising Lake Burrumbeet and Burrumbeet Creek project in the 2018 SDS, the former DELWP (Grampians region) led the Lake Burrumbeet Futures project which collaborated with partner organisations and the community to shape a longer-term vision for the lake. The Victoria's Great Outdoors investment program has also provided funds to improve recreation infrastructure at Lake Burrumbeet reserve, to support accessibility and visitor management.

However, with additional collaboration and investment, there are opportunities to broaden the existing scope of works, to support further restoration of the recreational, cultural and environmental values of Lake Burrumbeet, Burrumbeet Creek, Baillie Creek and surrounding wetlands. Lake Burrumbeet is the site of significant cultural heritage, including scarred trees, artefact scatters, and fish traps. Lake Burrumbeet is part of the traditional lands of the Burrumbeet Balug clan, of the Wadawurrung people. The name Burrumbeet means 'muddy water' in the Wadawurrung language.

The IWM process also offers the opportunity to create positive outcomes from urban development within the Burrumbeet catchment.

Specific actions for Lake Burrumbeet include:

- development of a clear and sustainable management model that will consider the natural, cultural and recreational values and future management aspirations of the Wadawurrung people
- consideration of the influence of flows and water quality from Ballarat North WWTP and local runoff to determine possible actions for enhancement
- further assessments to identify and implement management actions to address impacts on cultural values, such as introduced plant, animal, and aquatic pests
- protection, restoration and stabilisation of surrounding waterways and riparian zones.








	
Status	Concept
Lead agency	DEECA (Grampians), Wadawurrung Traditional Owners Aboriginal Corporation
Implementation partners	City of Ballarat, Central Highlands Water, Federation University, Lake Burrumbeet Ski Club, Friends of Lake Burrumbeet, Victorian Fisheries Authority, Arthur Rylah Institute, local landholders
Location	Burrumbeet Creek catchment
Scale	Sub-catchment

Beaufort Closed-Loop Recycled Water Scheme

This project aspires to a closed-loop recycled water scheme to manage all of the Beaufort community's wastewater within the urban environment. The Beaufort Closed-Loop Recycled Water Scheme project invests in environmental sustainability as well as the wellbeing and recreational benefits provided by Beaufort community facilities.

Since identification in the 2018 SDS, Pyrenees Shire Council has led the development of detailed designs for the delivery of recycled water assets to priority community facilities. To realise this design, Central Highlands Water is now leading the construction of necessary WWTP upgrades, a new pumpstation and three kilometres of pipeline which are due to be completed by late 2022.

The project is a partnership between Central Highlands Water and Pyrenees Shire Council, who remain committed to identifying and delivering further opportunities to supply recycled water and other diverse water supplies to uses that enhance the wellbeing and resilience of the Beaufort community.

						
Status	Construction					
Lead agency	Pyrenees Shire Council					
Implementation partners	Central Highlands Water, Wadawurrung Traditional Owners Aboriginal Corporation, Beaufort Golf Club, Beaufort Football and Netball Club, Beaufort Cricket Club, Beaufort Croquet Club, local schools					
Location	Beaufort					
Scale	Town					

Beaufort Linear: Green-Blue Infrastructure for a Small Town








The Beaufort Linear project has evolved as a direct result of the Green Blue Infrastructure for Small Towns project; a priority identified in the 2018 SDS.

The aim of this project is to undertake a co-design conversation with the community to inform a feasibility study and masterplan for a green corridor along the Garibaldi Creek in Beaufort. This corridor will link various recreational assets highly valued by the Beaufort community, located between Beaufort Lake and an area to the north of the railway line where the watercourse intersects with Yam Holes Creek.

The objectives are to improve water quality and environmental conditions along the watercourse and create a pedestrian link that provides passive recreation for the local community and visitors to enjoy.

The proposed recreational path will establish links between the caravan park at Goldfields Recreation Reserve, the school's precinct, the RV free campsite, the swimming pool, Beggs Street playground and the future town entry (after construction of a highway bypass). The potential for harvesting stormwater and retaining it in wetland areas for use on green spaces will also be explored.

The next steps include securing funding, then project planning and establishing governance and stakeholder relationships. A community engagement and co-design program will follow, with technical and feasibility work after that. This process will produce a masterplan.

						
Status	Concept					
Lead agency	Pyrenees Shire Council					
Implementation partners	DEECA					
Location	Beaufort					
Scale	Town					



Maryborough. Credit: Central Goldfields Shire Council

Lake Wendouree. Credit: Central Highlands Water (Peter Blackburn)




Integrated Management of the Tullaroop Catchment (Stage 2 – Implementation)

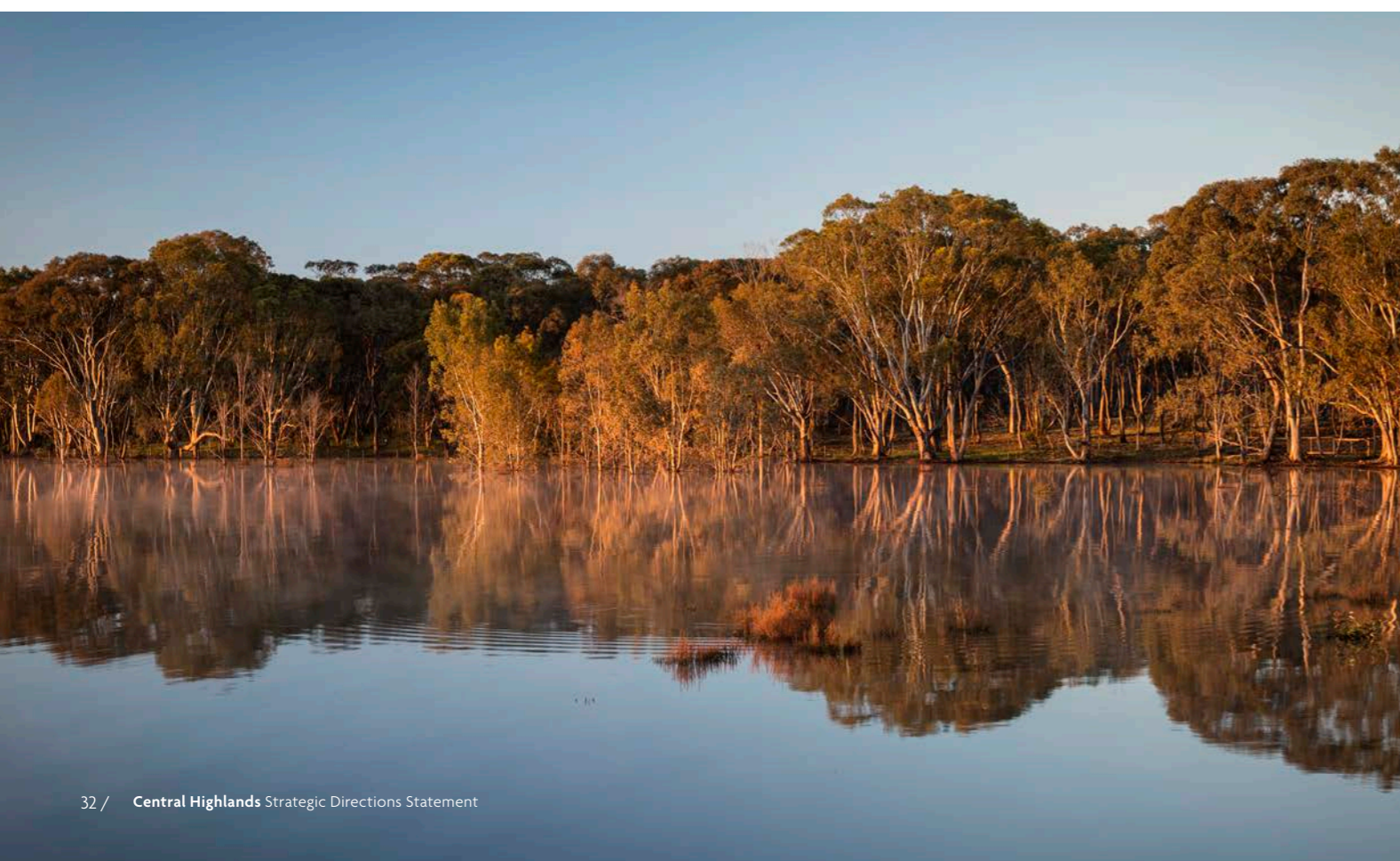
The Tullaroop catchment provides a range of environmental, social, cultural and economic values to communities in central Victoria. The catchment faces significant future threats to water quality and the health of aquatic ecosystems from uncontrolled livestock access to waterways and from climate change.

The Tullaroop Integrated Catchment Plan sets out the most cost-effective action to improve river health (fencing the remainder of Birch's and Tullaroop Creeks), improved water supply management practices (stock exclusion from the reservoir, as well as septic audit and compliance measures) and includes priority activities informed by an Aboriginal Water Assessment: Wartaka – cultural management and empowerment of landscape; revegetation and weed control at Long, Merin Merin and Middle swamps; and Djandak Wi – cultural burning and cultural heritage audits.

The plan now enters an implementation phase and will seek multiple forms of investment and ongoing collaboration to achieve the outcomes it sets out. Implementation of multiple IWM plans for the urban centres in the Tullaroop catchment will also play an important role in achieving the vision of the plan. Future results of the monitoring and evaluation outcomes will be provided to the community reference group and the IWM forum.

	
Status	Implementation
Lead agency	North Central Catchment Management Authority
Implementation partners	Central Highlands Water, Djaara (Dja Dja Wurrung Clans Aboriginal Corporation), Goulburn-Murray Water, Hepburn Shire, Central Goldfields Shire, City of Ballarat
Location	Tullaroop Creek catchment
Scale	Sub-catchment

Tullaroop Reservoir. Credit: Central Highlands Water (Andrew Thomas)



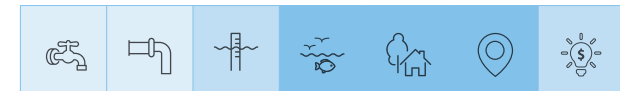
BUILDING ON MOMENTUM IN BALLARAT

Ballarat is a leader in IWM principles and practice. A wide range of projects have been delivered and more are underway, to diversify urban water sources, improve environmental outcomes and enhance the liveability and economic prosperity of the city. Six projects have been selected as priorities to extend, complement and enhance IWM in Ballarat. As the largest settlement in the Central Highlands region, these projects will drive the city forward as an exemplar of IWM.

Breathing Life into the Yarrowee River: Implementing Priority Actions

The Yarrowee River is the centrepiece of Ballarat and recognition of its importance to the community has grown over time. The delivery of works, as part of the 2013 Breathing Life into the Yarrowee River project, (improved vegetation, water quality and community access) heighten community interest in the Yarrowee River. As identified in the 2018 SDS, the Yarrowee River and Tributaries: River Corridor Masterplan was developed and finalised in 2020, almost 20 years after the original masterplan for the Yarrowee River was delivered.

The Yarrowee River and Tributaries: River Corridor Masterplan project generated further community interest and has been highly successful in identifying community outcomes for action. Now, through Action 4.4. of the Rivers of the Barwon (Barre Warre Yulluk) Action Plan, funding has been provided to support the delivery of priority actions (implementation) identified in the Yarrowee River and Tributaries: River Corridor Masterplan. This funding helps ensure the parklands can cater to the recreational needs of the growing community while balancing the protection of cultural and environmental values and restoring habitat. The City of Ballarat has also recently funded the installation of litter traps at key locations identified in the plan. Further funding is being sought through grant applications.

	
Status	Implementation
Lead agency	City of Ballarat
Implementation partners	Central Highlands Water, Wadawurrung Traditional Owners Aboriginal Corporation, DEECA (Grampians)
Location	Yarrowee River
Scale	Sub-catchment

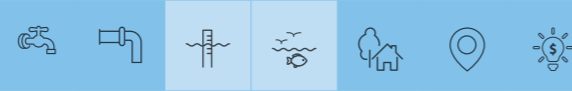
Expanding Ballarat’s Diverse Water Network

The existing non-potable network in Ballarat has potential for further expansion to support irrigation of schools, sporting grounds, parks and commercial premises. Some conceptual planning has commenced to demonstrate the feasibility of extending the existing recycled water supply network from Ballarat North WWTP to priority locations in Ballarat, including Wendouree West Recreation Reserve, Victoria Park and Mount Rowan Secondary College.

Strategic investigations have also commenced to explore diversifying water opportunities in the Ballarat West Growth Area, including a feasibility assessment and business case development for a residential development scale roof water harvesting scheme to supply managed aquifer recharge within the Cardigan Aquifer. Options for diversifying water supply for the Ballarat West Employment Zone are also being identified.

These schemes will further increase the use of rainwater, recycled water and stormwater across Ballarat, saving precious drinking water and supporting rapidly growing local communities by providing a fit-for-purpose water source for a range of different demands.

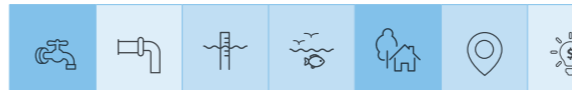
The next steps to deliver these priority projects involves securing co-investment funding, undertaking detailed designs and constructing infrastructure. While continuing to advance these existing opportunities, identifying new opportunities will continue to be a priority for Ballarat’s growth areas, and will be supported through the development of precinct scale IWM plans, as part of the precinct structure planning processes, when the next major growth area for Ballarat is confirmed.

	
Status	Sub-projects at various stages
Lead agency	Central Highlands Water
Implementation partners	City of Ballarat, Mt Rowan High School, Wadawurrung Traditional Owners Aboriginal Corporation
Location	Ballarat
Scale	Lot scale

Ballarat West Stormwater Harvesting Hubs

The Ballarat West Growth Area will provide 18,000 new homes for around 40,000 people in the next 20 years. The development will grow the urban footprint of Ballarat by almost one quarter. The additional stormwater runoff from the new development areas could have fundamental impacts on Kensington, Bonshaw and Winter Creek which are all tributaries to the Yarrowee River. However, due to early intervention in the planning process, there is an opportunity to create local ‘hubs’ for stormwater treatment wetlands, which can then also supply treated stormwater for open space irrigation, while preventing impacts on connected waterways. Further detailed designs are still required for transfer infrastructure, which will connect treated stormwater supplies to these recreation areas.

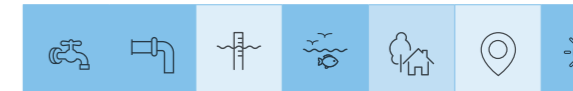
This project was originally proposed in the 2018 SDS and remains a priority for the region. In the next five years, focus areas for the co-delivery of stormwater harvesting in new development areas have been identified. For example, development near MR Power Reserve, Delacombe Town Centre and within the upper catchment of Winter Creek is imminent and provide some near-term opportunities.

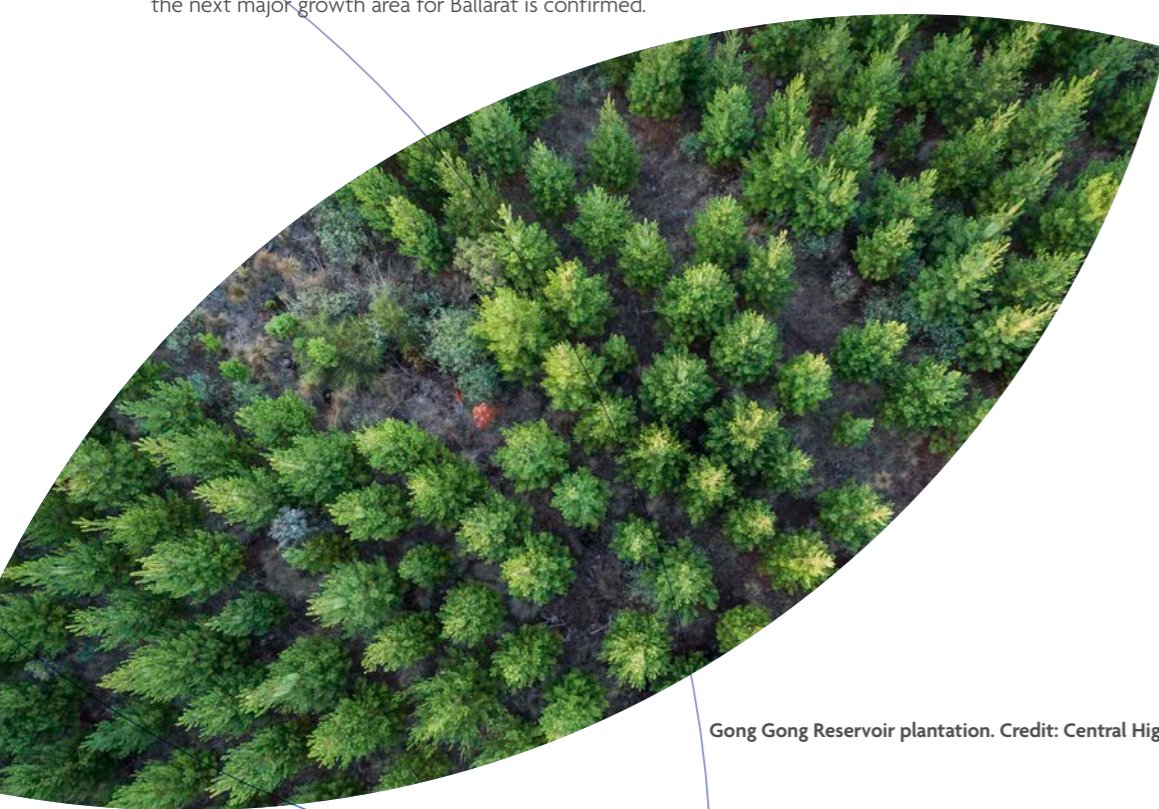
	
Status	Concept
Lead agency	City of Ballarat
Implementation partners	Central Highlands Water, Wadawurrung Traditional Owners Aboriginal Corporation, developers
Location	Ballarat West
Scale	Lot scale

Recycled Water for a Green Victoria Park

Initiated in the 2018 SDS, feasibility assessments have been completed to find a suitable diverse water source for irrigating Victoria Park, the key green space and recreational reserve in Ballarat and an important asset for communities in the region. This project will transform Victoria Park into a year-round green space to support numerous community clubs and attract events, as well as enhancing the existing lakes and public amenity.

The next stage requires detailed design work for irrigation infrastructure. The final detailed designs will be future focused, with the ability to accommodate the potential to extend the recycled water supply network from the park to service other areas and uses.

	
Status	Implementation
Lead agency	City of Ballarat
Implementation partners	Central Highlands Water, DEECA (Grampians), Wadawurrung Traditional Owners Aboriginal Corporation, user groups
Location	Ballarat
Scale	Precinct



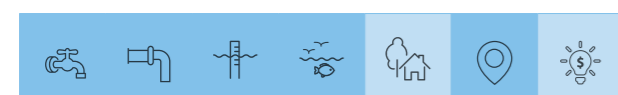
Gong Gong Reservoir plantation. Credit: Central Highlands Water (Andrew Thomas)

Mullawallah Wetland Management Plan

Mullawallah Wetland, in Ballarat's west, is a site of significance for the Wadawurrung people. It supports several species listed under Victoria's *Flora and Fauna Guarantee Act 1988* (such as the brolga and blue-billed duck) and under international agreements (such as Latham's snipe). Mullawallah Wetland lies north of Memorial Drive near the Ballarat Ring Road and is subject to extensive residential and industrial development. The region lies within a zone of decreasing annual rainfall and its catchment is becoming increasingly impervious through land development.

The Wadawurrung Traditional Owners Aboriginal Corporation, the Ballarat Environment Network and the Cardigan and Windermere Landcare Group have identified the emerging risks to the condition of the wetland including an increasing supply of pollutants, higher peak inflows and lower baseflows, and the drying climate. Each has the potential to impact the diverse wetland biota, as evident from changes to analogous wetlands elsewhere.

While there have been prior risk assessments, wise management of this ecological asset requires a holistic evaluation of hydrological change in the future. An opportunity exists to mitigate threatening processes and to implement management options that manage and capture runoff to offset a drying climate. The Wadawurrung seek to lead a project to manage water on Country and, with collaborators, to commission a plan for Mullawallah Wetland that explores management options under a changing climate and catchment hydrology.



Status	Implementation
Lead agency	Wadawurrung Traditional Owners Aboriginal Corporation
Implementation partners	City of Ballarat, Ballarat Environment Network, Cardigan-Windermere Landcare Group
Location	Ballarat West
Scale	Town

Miners Rest Flood Mitigation

Mitigating the impacts of flooding is a priority for the City of Ballarat, especially in a changing climate. Priority areas include Ballarat East, Buninyong, Gnarr Creek near Ballarat Central and Miners Rest. While all these priority areas are progressing at different stages, the Miners Rest Flood Mitigation Project is a large scale and well progressed project which City of Ballarat is working towards implementation.

The Miners Rest Flood Mitigation project has been in planning for several years with options considered and shortlisted. Flood modelling for Miners Rest has explored flood risks and identified and tested several mitigation options. The primary option identified through this study was the widening Burrumbeet Creek between Howe Street and Victoria Street, a section of about 1.3 km.

Burrumbeet Creek between Howe Street and Victoria Street is currently relatively inaccessible and is infested with exotic weed species, meaning opportunities exist to increase community access, while also taking action to restore environmental values. Further collaboration can increase the benefits in this area.

The project has been estimated initially to cost \$4.5 million, and will provide multiple benefits, including flood protection, waterway enhancement and water quality treatment for an adjacent development. The next phase of the project development will be to engage an engineering consultant to estimate the cost of the works. This will enable discussion of a funding model to be held with the stakeholders who will benefit.



Status	Committed
Lead agency	City of Ballarat
Implementation partners	DEECA
Location	Miners Rest
Scale	Town



Ballarat North Class A Recycled Water Facility. Credit: Central Highlands Water



Integrated Water
Management Forums



Environment,
Land, Water
and Planning